The Builder.

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Some Experiments with "Fireproof" Materials.

IN March we referred to some tests to which various "fireproof" materials had been subjected at Berlin under the auspices of the Royal Police Fire Brigade of that city. The experiments, which had actually taken the form of a competition for honours and premiums between different makers or inventors of fire-resisting specialties, were proposed by the Amalgamated German Insurance Companies as far back as 1889 on the occasion of the "Accidents Prevention Exhibition" held in Berlin that year, and it was at that time that these institutions subscribed the necessary funds for the money prizes which were to attract the trade and cover the unavoidably heavy expenses. The main object of the promoters having been to arrange their experiments as "naturally" as possible, some years had to elapse until a suitable site for operations could be found, and it was not until the Municipality of Berlin last year offered to put an extensive warehouse block at their disposal, that the preliminary preparations for the series of "fires" they proposed having could be taken in hand. The warehouse in question, which was destined for demolition on account of some street improvements, was admirably suited for the purpose; and after a careful reconstruction of the interior with the various materials and fittings the competitors wished to have tested, appeared to be almost indestructible by fire or water.

According to the official report which has now been published, a committee of eleven had to act as assessors, this committee consisting of architects, engineers, and fire brigade officers brought together from different parts of the country. Herr Stude, the late chief officer of the Berlin Fire Brigade, whose untimely death we had to report a few weeks back, was chairman to the committee; Herr Reichel, a senior officer in the same force, acted as honorary secretary, and was responsible for the general management of all the arrangements on the site of operations. There were eighteen competitors, including the Berlin Fire Brigade (*hors concours*), whose officers wished to demonstrate the very satisfactory resistance of the ordinary building construction if only conscientiously and correctly carried out. Some five months were at the disposal of the competitors for the reconstruction and fitting of the warehouse, and three days were set aside for the experiments. Prior to commencing the actual tests, the assessors, together with a number of invited experts, representatives of the technical press, fire offices, and Government departments, carefully examined the exhibits, officers of the fire brigade explaining all details as to construction, supposed qualities of the materials, &c. The assessors and visitors found the warehouse had been very cleverly divided up in such a way as to facilitate examination of the individual exhibits intended for the special protection of certain trades, &c., without, however, interfering with the general or more severe tests these exhibits had to undergo together with other materials. Besides the different classes of living-rooms and bedrooms, there was a retailer's shop, a general warehouseman's floor, carpenters' and frame-makers' shops, an oil and colourman's store, and even a mineral-oil depôt, all most "naturally" arranged, and everywhere, even in matters of minute detail, it was obvious that, as far as it was in Herr Reichel's power, great pains had been taken to insure *bonâ-fide* results. The tests were taken in hand systematically, first in the smaller, then in larger "risks," care being taken to let the various fires also originate as "naturally" as possible; finally, several floors and the staircase were set on fire at once, and a warehouse fire in its advanced stage represented. Care was taken to subject the exhibits to the temperatures, irregularities of temperature, sudden shocks by falling weights or jets of water, &c., which generally occur at conflagrations, and it is well to note that in nearly every case it was possible to take fairly exact observations. The instruments at the disposal of the assessors could take temperatures to a height of 1,460 deg. C.; the weights, momentum, and direction of fall were approximately calculated; the force of the different water-jets was taken from manometers, and the times by stop-watches. Directly after each test was completed, there was again a careful examination of the exhibits, accompanied in some cases by entire dismantling of the objects, and even afterwards by analysis; and it was then that among the valuable technical results arrived at, some object lessons could be learnt as to the ways in which the over-ardent patentee tries to prove the value of his wares in anything but a fair way. Doors supposed to be of some patent fire-resisting material, and that alone, were found to have inlays of silicates of cotton; ceilings had inlays of asbestos where certain patent plasters were supposed to be alone withstanding the flames, &c. One competitor, whose exhibit was very properly lauded, but who was very prone to these makeshifts, had even to be "most seriously recommended" (so the report sarcastically puts it) to learn to have more confidence in his very excellent wares before offering them to the general public.

It would naturally lead us too far to describe the many exhibits and numerous experiments in full, and we can only refer to such as are likely to call for special attention, either, on the one side, for very satisfactory, or, on the other side, for unexpectedly unsatisfactory, results obtained. As these extreme results were for the most part obtained with exhibits intended for the safe division of separate risks, we shall limit our descriptions to this class of tests, leaving the trials with staircases, fire-proofing of columns, uprights, &c., for a future occasion, as some further experiments of this class are intended to be made later on.

Perhaps the most remarkable experiments with satisfactory results were those with a patent fire-resisting glass, shown by Messrs. Siemens, of Dresden. The assessors have found it to be most suitable for any skylight or window necessary in a division between separate risks, as it will resist heat of 1,300 deg. (C.) for half-an-hour and more, bearing all manner of shocks, the sudden changes of temperature spoken of, and other strains, without appreciable damage. This material may be safely expected to limit the extension of any ordinary fire during its first and most critical period. Great care must, however, be taken in fixing plates of the Siemens's glass, as it has a tendency to expansion or bending under certain circumstances when in iron frames, in which case openings are formed between

the glass and iron through which flames can pass. The maximum size of the plates is 80 centimètres by 1·20 mètres, or, roughly, 2 ft. 7 in. by 3 ft. 3 in., the thickness varying according to the probable maximum pressure they have to resist.

The most interesting experiments with a negative result were those with a floor by the so-called "Isothermal" Company of Berlin:—Fig 1 shows a section through a part of this floor; the girders alternately support the floor alone, or both flooring and ceiling; the flanges of the latter carry the half-inch magnesite plates (marked *a a*).—Concrete (see *b b*) is filled in between the girders; the ceiling below (*c c*) is of a similar mixture on wire-netting, whilst the floor proper (*d d*) is apparently of cement alone. This "Isothermal" floor has of course been advertised as indestructible, and many authorities have approved of it on account of the improbability of irregular expansion and the protection afforded to the concrete by the plates. A fire which burned forty minutes and had at no time a higher temperature than 1,000 deg. C. however made great havoc of the exhibit, to such an extent in fact that nothing but the girders, badly twisted, remained in position. The floor had not even been tested with falling weights, and when touched by a stream of water from below whilst in a heated condition, had not even resisted the ordinary water pressure used from a hydrant for extinguishing. Tried from above as to its waterproof qualities when the top surface was damaged, similar unsatisfactory results were obtained. This floor, which was constructed essentially of iron with non-conductors on a theoretically correct principle, only too plainly showed how very necessary a *bonâ-fide* test is for the *savant* who would rely on calculations alone, and is too prone to forget actualities. The girders, which covered a span of 6 mètres, or 19 ft. 8 in., were only 50 centimètres, say, 19½ in. apart.

Fig. I

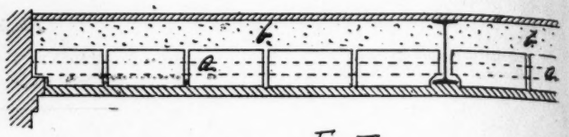


Fig. II

Another floor, also essentially of iron, with non-conductors, contrasted strangely with the "Isothermal" exhibit. This one was known as "Kleine's," and shown by Messrs. Wigankow, of Berlin. Figs. 2 and 3 give two sections through a part of this floor. The girders support both floor and ceiling. The flanges carry slabs (*a a*) made of a light Rhenish brick, cemented together and well tied with iron bands. The space between the girders is then filled up with slag (*b b*), the floor and ceiling proper being in cement. The assessors report this floor to be fire-resisting to a high degree. The fire which attacked it from below for three-quarters of an hour, showing temperatures of over 1,100 degs. C., did not affect it to any appreciable extent. It is true that the steam fire-engine which played on it from below brought down some pieces of the cement ceiling, which damage, however, in no way affected the resistance of the slabs. Shocks and weights up to 3,200 kilogrammes on the square mètre were tried without effect, whereupon the cement on the floor was broken to try if the slabs were waterproof, and satisfactory results likewise obtained.

Fig. III

The distance between the girders was 83 centimètres, or 2 ft. 8 in., the span for the girders 5·80 mètres, or about 16 ft. 4 in. The expression "thoroughly fireproof" was used in the criticism of the assessors; but this expression, as the late Herr Stude explains in the introduction to the report, should always be read "as fireproof as possible." The maximum resistance required of any so-called "fireproof" material should practically be that of one hour's duration against fire of an average temperature of 1,000 deg. C., with a maximum temperature of 1,500 deg. C. Such resistance is generally sufficient to allow for the extension of a fire from one risk to another being stopped by trained men with appliances, taking it for granted that the outbreak would not even be noticed until the average temperature mentioned had been operating some twenty minutes. The primary stages of the fire, the smouldering, &c., prior to a current of air fanning it, when a "light" would almost invariably be shown, should not affect a piece of "fireproof" construction to any appreciable extent. Not until the "light" is shown should the strain commence, and such a "light" is generally noticed in time to bring the first skilled assistance to the spot within half-an-hour of its first appearance.

A patent flooring by Messrs. Stolte was also spoken of by the assessors as thoroughly "fireproof." Messrs. Stolte are specialists in the preparation of various kinds of "cement plates." These they use for walls and doors as well as for floors. Their curved plates, which are made as light as possible for flooring, are illustrated in fig. 5. Figs. 6 and 7 show how they can be carried both by joists as well as by girders. The curved plates are either 2 or 2¾ in. thick. In fig. 6 they rest on the flanges of the girders, the lower faces of which are protected by small "cement boards" held in position by iron bands. In fig. 7 they rest on small L irons screwed on to the joists, the lower surfaces of which are protected by cement work. In both cases the space between the girders or joists is filled with sand, and an ordinary board flooring used. Fires of one hour's duration, with an average

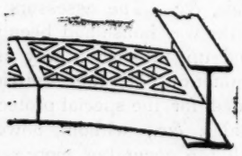


Fig. V

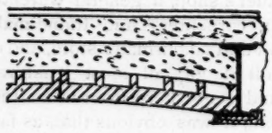


Fig. VI

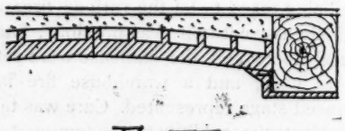


Fig. VII

temperature of 1,000 deg. C., had no noticeable effect on these floors. The plates in one or two cases showed slight cracks at right-angles to the bearers, without, however, decreasing the stability. The customary tests with shocks were tried without avail; streams of water from the fire-engines had no effect. Heavy weights were tried, a load of 10,370 kilogrammes on the square mètre eventually breaking one of the plates. The distance of the girders from one another is, unfortunately, not stated, but may be taken approximately at 80 centimètres, or about 31½ inches.

Messrs. Mack, of Ludwigsburg, in Würtemberg, who have a good repute for their excellent "gypsum boards," exhibited several floors which, according to the assessors, could likewise be termed "thoroughly fireproof," but were unfortunately somewhat susceptible to any contact with streams of water from below. Figs. 8 and 9 explain the construction of the "girder" floor tested. The flanges of the girders (which are 83 centimètres, or 2 ft. 8 in., apart, and have a span of 5·80 mètres, or about 19 ft.) carry the plates (*a a*); the space between the girders is then filled up with a light "pumice" concrete (*b b*), the floor proper being rendered in Portland cement. The ceiling proper is of ordinary mortar work, the lower face of the girders which it covers, however, being first prepared with wire netting. The numerous shocks and other trials which the floor had to undergo during the forty minutes a fire of an average temperature of 1,100 deg. C. raged below, had no effect; weights of 1,000 kilogrammes were tried with little result, but a jet from the steam fire-engine easily knocked off part of the lower surface. The plates are supposed to contain as large a percentage of cork as of gypsum, bamboo rods and hair keeping the various materials together.

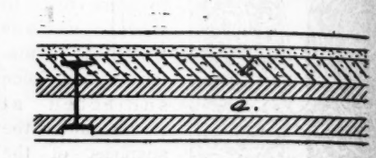


Fig. VIII.

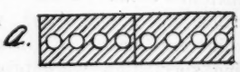


Fig. IX.

Whilst Messrs. Stolte's, Messrs. Macks, and the "Kleine" exhibits described are classified as *bonâ-fide* composite floorings, the "Monier" floor, of which fig. 10 shows a section, is generally classed with the concrete arches, although it is also essentially a composite construction—*i.e.*, a combination of cement with a framework of wrought-iron

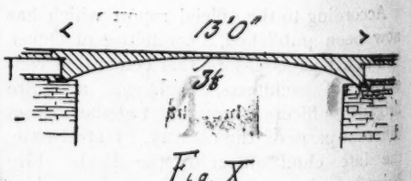


Fig. X.

bars of about ½ in. in diameter, and mostly supported by girders. The dimensions of this "Monier" exhibit, which had been put before the assessors by Messrs. Waysz & Co., of Berlin, are marked on the illustration. The series of tests to which the "Isothermal" and other floors had been subjected were repeated, the average temperature in this case being again 1,000 deg. C., the loads on each square mètre as much as 2,613 kilogrammes. No appreciable damage was done, and the assessors were able to express their confidence and entire satisfaction by reporting the exhibit to be "thoroughly fireproof." It would, perhaps, be well to remark that the report was not based on one experiment alone. As in all the cases described, there were several exhibits, but, as before said, space prevents taking notice of any but the most important ones.

The composite floors described were practically all intended to be used with iron girders, although fig. 7 showed how a joist could in one case be substituted. The two following floors (see figs. 11, 12, and 13) are now

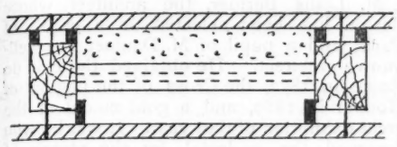


Fig XI

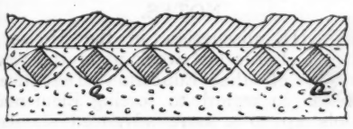


Fig XII

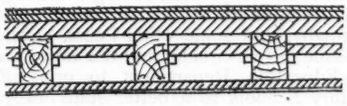


Fig. XIII

essentially such as are designed for joists alone, and where no iron, but wood only, with non-conductors, is used.

The floor illustrated in figs. 11 and 12 is protected from below by a very carefully-prepared combination of plaster and wood lathing, the former a patent composition, the latter well interlaced with wire to prevent any change of position. This lath and plaster work, if we may so call it, is kept some distance from the lower surface of the joists and pugging, the space between being well ventilated. The pugging (a fibrous plaster one, we believe) carries a layer of loam, and the floor proper above is of cement on lath-work, arranged similarly to that of the lower surface. The greatest pains were again taken to damage this floor, and a fire with an average temperature in this case of as much as 1,250 deg. to 1,300 deg. C. was kept up half-an-hour. The only noticeable effect, however, was the falling off in some few places of bits of plaster just below the extreme points of the lathing (*a a*), the lower surfaces of which were then found to have been badly charred. At no point had the lath and plaster work been opened either by the fire or water so as to allow the flames to touch the joists or pugging; though in one or two instances slight cracks, probably occasioned by change of temperature, were visible. During the fire, among other tests, a succession of weights of 50 kilogrammes were dropped on to the floor from different heights, but no damage was caused by them except a breakage of the upper surface. Even when this surface was broken, the floor also showed itself to be entirely waterproof from above—in fact, the exhibit in every way so thoroughly satisfied and astonished the assessors, that its success ranked next to the Siemens's glass we have spoken of above. Herr Schubert, of Breslau, is the maker of this floor, and the patentee of the lath and plaster work, which was also, by-the-by, tested with equally good results as a protection to walls, &c.

The floor shown in fig. 13 was exhibited by Messrs. Macks, of Ludwigsburg, whose "girder-floor" we have already referred to. In this case the patentees used thin gypsum "boards" and plaster instead of the 4-in. hollow "plates." The joists, the surfaces of which had been well planed, were protected from below by 1¼-in. "boards," the pugging was of 2-in. "boards," the space in between being well ventilated, and the floor proper of 2¾-in. "boards," with 1 in. of a patent plaster above. The boards are comparatively light, and their composition is supposed to be somewhat similar to Wilkinson's fibrous slabs. In this case the fire lasted one hour, the mean temperature being 1,100 deg. C. The result was that the whole of the lower surface, *i.e.*, the thin boards which formed the ceiling proper, had fallen down, the heat having caused the primary damage and weakened the holding power of the joists, and a stream of water having brought about the actual collapse. The joists were severely burnt, but not to such an extent as to let the well-weighted floor give way. The pugging had offered resistance, and the fire had not been able to pass to the risk above. According to the assessors, this floor, though badly damaged, would still be practically classed with the "fireproof" ones. It had offered resistance for an hour, and taking it for granted that substantial joists were used, there was no reason to believe that the system, with its well-laid pugging and flooring, would give way under the strains that it would be reasonable to expect this class of flooring to withstand. The susceptibility of the Macks' exhibits to water-damage was, however, again much remarked upon.

Walls, floors, and the protection of the necessary openings in them are the parts of a building which have to be considered most in the selection of fire-resisting materials. A "fire-proof" staircase, however safe, will be useless if smoke enter it from an unprotected opening. In cases like the warehouses of St. Mary Axe, which have lately been destroyed, the use of strong walls is general on account of the loads they have to support; good planning, with a careful division of risks, can then render a block practically safe if only the right material be chosen. The experiments with floors described above should aid the selection of horizontal divisions, as there were a number of positive results, and the Siemens glass is a good example of the materials suitable for the protection of window-openings and sky-lights, without using the make-shift shutters which generally remain unclosed through sheer negligence. As regards the protection of door-openings, the Berlin tests can, however, scarcely be said to have been as instructive as we should have wished, excepting in a negative sense; as there were several interesting cases of substantial-looking constructions not coming up to the assessors' expectations. An ideal "fire-proof" door (which would, however, probably also be left open as often as the less reliable one) should, like a floor, resist a fire of 1,000 deg. C. at least one hour, withstanding sudden strains up to 1,500 deg. C. It should then be absolutely smoke-proof, and not be ever affected to such an extent as to be immovable when in a heated condition. The greatest fault for a door would be its susceptibility to bending out of shape, as the slightest twist allows smoke and flames to pass through the opening.

A door by Messrs. Schubert, the body of which was of wood with a light iron framing, though "fireproof," was quite impracticable on account of its inconvenient weight. The wood was protected first by a layer of earth, then by a layer of asbestos, on this some wire netting which held a thick layer of cement work. The door, which was 6 in. thick, measured about 3 ft. by 6 ft. It had to withstand a fire of 1,000 deg. C. for an hour and a-half. A second door by the same firm was of magnesite plates of 1 in. thickness. The magnesite was visibly affected by the same test, and bent to such an extent that the room it was to protect was soon filled with smoke, and caught fire.

Another door, by Messrs. Violet, of Berlin, of which much was expected, was likewise a failure. Fig. 14 illustrates this door, which

Fig. XIV.

shows an iron frame (*a a*) with a double layer of boards (*b b*), protected by iron plates (*c c*). The iron plates, expanding, bent outwards, leaving the wood unprotected. The door almost at once showed itself to be anything but smoke-proof, and after about half-an-hour's fire of 1,000 deg. the flames burst through it. Strange to say the frame neither bent nor jammed and if the rims of the plates had been better protected, and some non-conductor placed behind them, better results would no doubt have been obtained. The door measured 76 centimètres by 1·86 mètres, or 30 in. by about 6 ft., and was about 1¼ in. thick.

Messrs. Huber & Co., of Breslau, exhibited a door measuring 90 centimètres by 1·90 mètres, or 35⅓ in. by about 6 ft. It had a thickness of about 1⅜ in., and as in the case of Messrs. Violet's door, was unfortunately fixed in a L iron wall-frame. Fig. 15 explains the

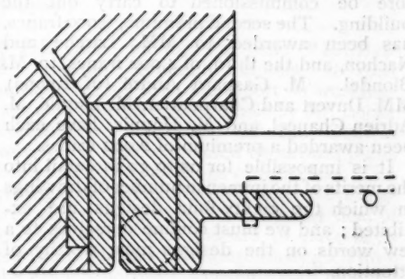


Fig. XV.

construction, the part between the T irons being "Monier" work (*a a*), *i.e.*, cement on framework of ¼-in. iron bars (*b*). The Monier surface withstood a fire of 1,100 deg. C. splendidly for forty minutes, but the door as a whole bent badly, smoke almost immediately entering the room, and the flames soon having a free passage into it.

Uncertain results were obtained from some doors shown by Herr Kühlewein, of Berlin. These, the largest exhibited, were not let into rebates in the openings, but simply covered them. They consisted of light iron framework held together by metal bands and covered on both sides by "asbestos cement" slabs. Here one door after forty minutes at 1,000 deg C. bent, whilst another gave ample protection for one hour against a fire of 900 deg. C. Similar doors are to be tried again, as there was apparently some flaw in the hanging of the faulty one. Their dimensions were 42 in. by 6 ft., and the thickness 1⅜ in.

The only door, in fact, that received the assessors' approval was one of remarkably simple construction, exhibited by the Berlin Fire Brigade. Its body was of double oak boards nailed at right-angles to one another, well covered in with sheet iron, the ends of which overlapped and were nailed down. This door (like those of Messrs. Kühlewein) was hung not *in* but *over* the opening, being some 6 in. larger than the latter in each

direction. The fire to which it was subjected had a mean temperature of 1,000 deg. C., and a duration of some seventy minutes. The door showed itself to be thoroughly fire and smoke proof, but on being examined the wood was found to be badly charred. A thin layer of some non-conductor would have probably remedied this failing, but as the firemen exhibiting had limited their contributions to "everyday" constructions, the use of such a material was not permissible.

The report of the assessors gives no information as to the cost of the exhibits, as the promoters wished to avoid anything that would tend to let a commercial feeling show itself in connexion with the tests. This omission is, of course, in one sense an unfortunate one, as opinions as to the practical utility of the materials would be partially dependent on such information. For all this the experiments alone will have been invaluable to many, and even if the commercial element may have been rather too conscientiously avoided, the efforts of the promoters and the assessors should be fully appreciated. For once we have not had to deal with the tests of a tradesman advertising his wares, but with a *bonâ-fide* investigation in the interests of science alone.

COMPETITION DESIGNS FOR THE OPÉRA COMIQUE, PARIS.

AS we have already mentioned, the eighty-four designs sent in for the rebuilding of the Opéra Comique have been exhibited at the Palais de l'Industrie. The jurors appointed to decide on the merits of the various designs gave their decision last week. They have awarded the first premium, of 10,000 francs, to M. Bernier, who will therefore be commissioned to carry out the building. The second premium, 6,000 francs, has been awarded to MM. Larche and Nachon, and the third, of 4,000 francs, to M. Blondel. M. Gaspard André (of Lyons), MM. Duvert and Charpentier, M. Esquié, M. Adrien Chancel, and M. Dupuis, have each been awarded a premium of 2,000 francs.

It is impossible for us to go in detail into the merits of the immense number of drawings in which the eighty-four designs are exhibited; and we must confine ourselves to a few words on the designs most worthy of attention.

That of M. Bernier, which we presume will eventually come into actual existence as a building, is characterised by a classic severity of style and treatment. The principal façade, a little heavy in effect, presents on the ground floor three arched doorways flanked by two square-headed doorways at the sides; on the first floor stage are three large arched bays, the reveals decorated with bas-reliefs, framed within an order of Corinthian columns, over which, in the attic, are groups of sculptured figures. The side elevations show the same simplicity, the same correctness, and we might add the same coldness and formality of design. What has given this design its place in the competition is no doubt the technical portion of the drawings, which give evidence of very careful study, and the excellent arrangement of the plan in regard to entrances and exits. The corridors and rooms for the artists have also received very careful attention in regard to planning and arrangement. But M. Bernier seems to have made one mistake in not providing behind the scenes an independent passage connecting the two sides of the house. The possibility of passage exists, no doubt, but only across the stage itself, and in case of a panic there might be a fresh disaster to a crowd entangled amid scenery, "practicable" erections, and all the other inflammable adjuncts of a stage in working order. With that exception M. Bernier's plan is excellent, and he has shown great ability in making the most of the rather small area allowed for the site.

The same severity of style is seen in the façade by MM. Larche and Nachon. Here again the jurors have evidently laid the principal stress on the interior arrangements, and perhaps with reason, since it is above all things desirable that the possibility of such a catastrophe as that which accompanied the destruction of the former house should be reduced to a minimum. One might, however, have reasonably demanded a somewhat less dull and commonplace architectural treatment. The great defect of the whole competition is the almost entire lack of originality of conception, and it would seem as if nearly all the competitors had set before them as a model the classic type of theatre which was in fashion under the second Empire, such as the theatre at the Place du Châtelet, or the "Gaîté" and "Vaudeville."

M. Blondel, the third in the race, has, however, evidently been haunted by reminiscences of the Opera House. His design is sufficiently decorative in effect, and has more life and interest in it than the two first-named, and the plan is cleverly arranged. The design by MM. Duvert and Charpentier, for which the Department of "Bâtiments Civils" evinced a great predilection, is certainly little worthy the credit awarded to it, and we much prefer the design by M. Gaspard André of Lyons. His elliptically-planned façade, with a loggia on the first floor stage behind an order of Ionic columns, is very attractive in appearance and excites a good deal of attention.

M. Esquié has submitted a design which is very poor in regard to plan and general arrangement, but of great originality in regard to architectural design. The principal façade shows a large arch springing from coupled pilasters, beneath which are seen, in deep shadow, large circular-headed arches surmounted by a fan-shaped tracery window. The balconies of the first floor are supported by caryatides, and the angles are adorned by large winged figures, with harp and violoncello respectively. The whole is crowned by a rounded cupola which, with its profusion of sculptured accessories, looks rather like an Indian pagoda. The design has at least the merit of offering a vigorous contrast to the architectural commonplace of its neighbours, while it has not so much of the appearance of a provincial theatre façade.

The elevation by M. Adrien Chancel is much more simple in style, but of fine character of design. The large staircases are a fine feature of the design, but the foyer, on the other hand, is rather cramped in proportions. Two covered carriage porches are provided; and on the whole the principal façade is one of the best in the set, and might have claimed a better place in the competition.

In addition to the special premiums, honourable mentions have been awarded to the designs by MM. Ballu, C. Bernard, Cousin, Blavette, Bréasson and Camut, Breffendille, Brumeau, Courtois - Suffit, Dauphin, Delestre, Richard, Gervais (the architect of the Théâtre des Arts at Bordeaux), Gerault, Henry and Massa, Leclerc, Mayeux, Morice, Paulin, Gray and Bossis, Pujol, Raulin, Ruy and Loison, Schmit, Tronchet, and Rey. We have not space to say anything special of these, and most of them do not present anything of much interest. We may mention, as showing some originality, the gay-looking façade by M. Raulin, with its loggia painted in red in the Pompeiian style, which opens on a large balcony ornamented with faïence and tiled panels, with light blue columns accompanied by sculpture also in polychromy; a very good design for a casino at a watering place.

In the main, in spite of the number of talented architects among the competitors, the competition has not brought to light many new ideas or contributed much to the progress of theatre architecture. It would appear also that many of the competitors are but little acquainted with the official regulations in regard to French theatres, and have not taken the trouble to consult experts who could have furnished them with important hints in regard to the arrangement of the various departments in the interior of the house. It must be added that the competition has taken place under very unfavourable circumstances, owing to the unfortunate parsimony of the Government, which has refused the three million francs necessary to purchase the expropriation of the houses lining the Boulevard des Italiens. The new theatre will therefore, like the old one, be surrounded by narrow streets and private properties, with the stage portion backed by house property in close contiguity to it, a situation which creates an extra risk both to the theatre and to the adjoining property. It would have been far better to have built the theatre so as to present a full front towards the boulevard, which would have been an ornament to the street and at the same time have allowed of greater space being devoted to the plan, and of arranging the interior in such a manner as to afford both a more convenient plan and a better guarantee of safety to the public.

M. Louis Bernier, the architect whose design has been selected, is a native of Paris, and a pupil of M. Daumet, the well-known architect. He obtained the Prix de Rome in 1872, the Cross of the Legion of Honour in 1889, and a gold medal at the great exhibition of that year. It was he who designed the pedestal for the statue of Barye, which is to be inaugurated next year on the Île Saint Louis.

NOTES.

THE discussion in the House of Lords last week upon the views of the Education Department in regard to forcing Elementary Schools up to a more advanced standard of perfection in regard to structures, ventilation, and sanitation, was not very creditable to some of the members of the Upper House. In January last a circular was issued to the Inspectors, asking them to give their attention to the above matters. Lord Harrowby, and some other Peers, consider the issue of this circular and the intention of the Education Department to bring Elementary Schools to a better state in regard to these matters as an attack on the voluntary system. We are not concerned here with the merits or demerits of either the Voluntary or the Board School systems; but it is certain that if the managers of voluntary schools try to shirk their responsibilities in regard to the school structures under the plea that the Department is attacking the voluntary system, they will not obtain sympathy from any intelligent person. It is most desirable that the elementary schools of the country, whether supported by voluntary contributions or by rates, should be thoroughly healthy—in other words, that they should be well built, well lighted and well ventilated, and that their sanitary state should be up to the level of modern requirements. There is no doubt that many of the elementary schools are not up to the mark in this respect; and if the advocates of the voluntary system desire to retain the confidence of the community they should embrace the present opportunity. Where schools are in good condition the managers can take credit for this; where reforms are needed they can show that they appreciate their responsibilities by undertaking improvements without delay. To endeavour to stave off sanitary reforms on the ground that voluntary schools cannot find the money to undertake them, is neither more nor less than a confession of incapacity.

THE sixth annual meeting of the National Association for the Promotion of Technical and Secondary Education, which was held this week, was of a congratulatory character. There is no doubt that technical education has made a fair start in this country, and that this Association, by con-

tinuing to give advice and information as to the best methods of using the money at the disposal of local authorities, is doing most valuable service to the country. To a large extent the County Councils and similar bodies are working tentatively and in the dark; but it is satisfactory to find that some County Councils have sent their organising secretaries to the Continent to collect information. For the present it is most important that they should avoid mere hobbies, and spend their money cautiously. It was naturally, also, a matter of congratulation that the London County Council had at length taken up the subject of technical education, and we are glad to see that the work of the City Companies, who have been in advance of the time on this subject, received merited praise. The Duke of Devonshire, who presided on this occasion, suggested that valuable information could be obtained were another Royal Commission appointed to take up the inquiries on this subject from the date when the Royal Commission appointed in 1881 made its report. We confess that at present it is doubtful if the appointment of such a commission would be desirable; this National Association can give much information, and the present need is chiefly for organising the existing force; the Executive Committee could probably advise any County Council satisfactorily as to the best way to employ the money in its hands.

THE lack of unanimity with regard to the coal trade crisis has become more apparent since last week, both among masters and men. A comparatively large number of miners in the Federation districts are still without notice from their employers, and they are not all inclined to cease work of their own accord. Northumberland and Durham are entirely averse to this course—which is not surprising, as, if they hold aloof, the result will be the restarting of many collieries that have continued idle since the last strike. The Durham men have to say yes or no on the question of asking for an advance of 15 per cent., and also as to whether they will join the Miners' Federation in their strike against the 25 per cent. reduction. It is a significant fact that the Executive Committee of the Durham Miners' Federation have declared the success of a general strike, in their opinion, to be impossible; remarking, in a circular addressed to their members, that "we should not be doing our duty if we did not plainly tell you the consequences, and urge upon you not to be drawn into this dispute, except to give what support you can to those who may be in it." Of course the "support" desired by the Federation is that everybody connected with coal mining and coal carrying should cease work simultaneously. In all probability the two northern counties, at least, will decline to do so; and it would therefore appear that this district, if it does not exactly hold the key of the situation, will largely determine the course of events. In the meantime the consumer, as usual, is already being drawn upon to pay the piper.

THE debate in the House of Lords on Tuesday in regard to the betterment clause in the Bill of the London County Council as to, among others, the Tower Bridge improvement, was unsatisfactory. Lord Onslow and the Duke of Argyll introduced a good many irrelevant questions, in which some Peers considered that they were voting for or against the betterment principle; others considered that the question in the present case was too small to be worth real opposition. On the whole the feeling was not averse to betterment as a principle if fairly carried out, and it was certainly felt that to reject the entire Bill because it dealt with betterment in regard to one improvement on a minute scale would not be satisfactory. The question cannot be set finally at rest until the principle has been discussed in Parliament free from particular considerations.

A SPLENDID collection of the late Gottfried Semper's drawings, numbering some twelve hundred sheets, has just been presented to the Saxon Royal Academy by the son of the eminent architect, Herr Manfred Semper; and the authorities of this institution have decided to give the valuable gift a separate hall in their new home on the Bruehlsche Terrace. The drawings include Semper's original sketches for nearly every building he carried out, in many cases accompanied by such working drawings as he made himself, and other fine drawings illustrating designs not carried out, such as one for the proposed Munich Opera House, the Rio Janeiro Opera House, &c.; and some four hundred measured drawings, taken when travelling in Greece and Italy from 1831 to 1833. The collection has been most carefully arranged, and thirty-seven divisions have been made to assist the classification of the drawings. Semper, it will be remembered, died in 1879, and soon after his death his son commenced a publication of his drawings, which had, however, to be broken off at an early stage from financial and other reasons. In presenting the collection to the Saxon Academy, Herr Manfred Semper, however, reserves to himself the right of continuing their publication, which we hope may some day be completed. We hear that Zurich has also come in for some of Semper's drawings, a collection of some four hundred and fifty having been presented to the Semper Museum in that city. These drawings mostly relate to such work as he carried out during his stay in Switzerland from 1855 to 1870, and to the college work and studies he did as a Professor in the Zurich Technical College.

THE annual exhibition of works of students in competition for the prizes in the various schools of art has been held during the past week at the South Kensington Museum. As a temporary building had already been erected for other purposes in the court-yard of the Museum, the various drawings, designs, and models have been placed there, much to the advantage of the drawings themselves and to those who go to see them. Whether, owing to the greater space or not, the present exhibition conveys the impression of greater size than usual, and there is some very excellent work in all the departments represented. In the Architectural section are a large number of measured drawings from old work. Alfred J. Dunn (Birmingham) sends carefully-measured work illustrating portions of the cloisters at Gloucester Cathedral, a bay of the lavatory arcade, a bay of the north wall, and the doorway in the west walk, with plans showing the vaulting, sections, and details—altogether an interesting set. Ralph W. Bedingfield (Leicester) submits a set of drawings in brown ink, a trifle weak in execution, of the organ screen at King's College Chapel, Cambridge. A highly interesting set of drawings of the Roman Villa at Brading, discovered a few years back, with careful details of the mosaic pavements, is by Hy. C. Wallis (Ryde, I.W.), and has been awarded a silver medal. Amongst others of interest are South front of Hall in the Wood, Bolton-le-Moors, Lancashire (Joseph Knight); Ye Olde Oake House, West Bromwich, elevations, plan, and perspective (Wm. C. Green); a set of drawings illustrating the interesting church of Kilpeck, Herefordshire, by John Pocock (Hereford), with details of the fine south porch and chancel arch, Warkworth Church, near Banbury (John E. Thorpe), a small church of the Decorated period; the church of St. Giles, Sandiacre, Derbyshire, showing a fine Decorated chancel, but the drawing rather spoiled by the blacking-in of the windows (Lawrence W. Bright); a chimney-piece in Bablake's School, Coventry (Joseph H. Poole); the Church of St. Mary, Dalton-in-Furness, elevations, plans, and sections (Robert P. Nelson), and some good good bits of wrought ironwork from Warwickshire, including fine gates from S. John's Hospital, Warwick (by James A. Swan). The architectural designs are not so uniformly good. By far the most original in design is a study of a church (Jas. H. Tonge, York), which has some very picturesque features, and seems to have been well thought out. Amongst the drawings is one showing a simple altar, and a typical reredos over. This set has been awarded a gold medal. There is a fair design for a tennis pavilion (by John E. Thorpe), but the other designs, which cover a great many subjects, from a Cathedral to a country post office, are not of much merit either as regards design or draughtsmanship. Some effective ironwork design is submitted by Sydney Newton (Leicester), and Wm. Feen (New Cross), the latter also having an effective design for a mosaic floor and a hall lantern and lock plate. Among the decorative designs, ladies have been largely successful. Very clever designs for mosaic pavements are shewn by Mary Caldwell (Canterbury), Evelyn D. Foster (Hertford), Charlotte Trower (Hertford), and Gertrude Roots (Canterbury). Two designs for linoleum or floorcloth by Fred. W. Gregory and Fred. Appleyard, and a design for a majolica plaque by Horace E. Drake, are worthy of notice. Also two designs for pottery by Wm. Hindley (South Kensington), and a full-size detail of a wall-paper in two shades of blue by Clara E. Byrd (Birmingham). Book decoration designs are shown by Sydney Heath and Georgie E. France, the latter including some delicately drawn menus, invitation cards, &c. Among book illustrations are excellent examples of penwork by Alfred Jones (Manchester), being illustrations for "The Travelling Companion" by Hans Andersen, and "A Combat" by Robert Spence (Newcastle-on-Tyne.)

THE last number of the "R.I.B.A. Journal" contains extracts, at considerable length, from the report on working-class dwellings in France, made by Mr. Locke Worthington as holder of the Godwin Bursary. It is accompanied by several plans of recent French buildings of this class. The investigation summarised in Mr. Worthington's report must have cost a great deal of time and labour, and appears to have been very thoroughly and conscientiously gone into. The French, however, have only very recently taken up this subject seriously, and from the plans given in the Journal it would hardly appear that we have anything to learn from them in reference to plan and arrangement. The system of having w.c.'s opening direct out of living-room, kitchen, or scullery, which we observe in the buildings erected by the Société Philanthropique from the designs of their architect, M. Chabrol, is to English notions most objectionable in regard both to decency and sanitary considerations. The former is a matter depending, no doubt, on the varying views and habits of different populations, and everyone knows that in this respect French ideas, even among the upper classes, are by no means so delicate as English; but sanitary principles are of universal application, and what is bad in London in this respect is equally bad in Paris. In the plan of the working class dwellings at Rouen, erected by the "Société Anonyme des Petits Logements" (M. Lecœur, architect) the closets are arranged either off the staircases and entries (in a much too public manner in regard to access) or out of small yards at the backs of some of the houses; these latter are satisfactory as regards method of access, but their doors are close to the windows of some of the ground floor living-rooms. The most practically interesting passage in the report, for English readers, refers not to construction, but to the system of providing for free-hold houses carried out by some of the societies mentioned, which "act on the principle that it is not sufficient to provide that the workman should have an agreeable and healthy home, but that it is desirable to

so arrange building operations that he shall have a secure holding and shall eventually become the proprietor." A society called "Le Cottage," at Oullins, near Lyons, has for its object the providing of small houses for sale to workmen. The principle is to construct "to order"; it is therefore known in advance who will be the occupier and intending purchaser, and the latter may have such modifications in the standing type of plan as suit his personal tastes. The rents are arranged so that the property is acquired by the tenant at the end of fifteen years. The shareholders are debarred by the rules of the society from receiving more than 5 per cent. dividends. We are not told, however, how much they actually do receive as a rule, which it would be useful to know. Any provision by which the tenant of such a house can eventually become its owner is a most valuable one in a social sense, as giving the working man a more direct interest in his home. Mr. Worthington's report and the plans, twenty-seven in number, which accompany it, are to be preserved in the Institute library.

AT the present crisis in the career of Drury-lane Theatre we shall not, perhaps, do amiss in giving a short note as to its history. In the early years of the seventeenth century the cockpit in Drury-lane was converted into the Phœnix Theatre, and there, in 1629, was performed "The Wedding," by Shirley. The theatre, after having been twice sacked by the apprentices, was pulled down by a party of fanatical soldiers in 1649. At the Restoration Rhodes, a bookseller, rebuilt the house, and there Sir W. Davenant and his company, which included Betterton and Kynaston, performed until their migration to the "Duke's" in Portugal-street in 1662. This theatre's site became Cockpit-alley (since Pitt-place), Orange-court, Wild-passage, and Stewart's-rents—all demolished twelve years ago for the Peabody Dwellings standing along the north side of Kemble, formerly Prince's, street. On Thursday in Easter-week, March 8, 1663, Killigrew opened the "King's House" with Beaumont and Fletcher's "Humorous Lieutenant," performed at three o'clock. This is the "King's House" in the Riding-yard, measuring 112 by 59 ft. on plan, so familiar to readers of Pepys. The patent to Killigrew does not restrict the choice of site beyond its being "assigned and allotted out by our surveyor of works"; nor has it been regarded as attaching to a particular site. But the site has remained unchanged to this day between Vinegar-yard and Russell-street. In January, 1671-2, a fire destroyed the "King's House": it was rebuilt by Sir Christopher Wren, and opened on March 26, 1674, with a prologue and an epilogue by Dryden, who had joined with Killigrew, Hart, Mohun, and others, in the new venture, known also for a while as the "Covent Garden" Theatre. Rich, Steele, Dogget, Wilks, Cibber, and Booth were, in turn, patentees. On Sept. 15, 1747, Garrick opened it with Johnson's well-known prologue to "The Merchant of Venice," and there on June 10, 1776, he took leave of the stage, playing the part of Don Felix in "The Wonder." Mrs. Siddons first appeared here in 1755. John Kemble's managership began in 1788. Three years later the old theatre, which had been refaced by the Adams, and stood behind the Rose and Windmill taverns in what was Brydges-street, was pulled down and rebuilt, on an extended scale, by Holland, with a capacity for nearly 4,000. This is the house that was burnt down in the night of February 24, 1809. The present house was designed by Benjamin Wyatt, on the plan, it is said, of the theatre at Bordeaux, and was opened on October 10, 1812, with Lord Byron's prologue. In 1818 the theatre was let for 10,200*l.* per annum to Elliston, for whom Beazley curtailed the auditorium, and added the cast-iron colonnade in Russell-street, and the portico in Catherine- (formerly Brydges) street, which is surmounted with a leaden figure of Shakspeare. This is the theatre associated with the career and compositions of Balfe. The pit door of the old house remained, until a few years ago, in Cross-court. Here Edmund Kean made his first entry in 1814, and on February 26, 1851, Macready finally retired. The existing ground lease will fall in at Christmastide next year, and the Duke of Bedford has informed the renters that he is unwilling to renew it. We believe that the lessee now pays 6,000*l.* a year, augmented by 10*l.* for each performance after the first 200. A year's rent of 1,365*l.* is paid to the Duke, and 3,100*l.* goes to the new renters' trustees. Drury-lane, as a playhouse, is, as also is Covent Garden, free from the Lord Chamberlain's jurisdiction, and has been so since 1837, when Bunn declined to renew the hitherto customary licences of about twenty-one years each, on the ground that he represented the "heirs and assigns" of the original patent, of April 25, 1662, to Killigrew. Whether the patent is still alive, and whether it will go to the new theatre (if there be one), are two legal points which will possibly, by-and-bye, come up for decision. Upwards of 218,000*l.* is said to have been spent upon the house, which is uninsured.

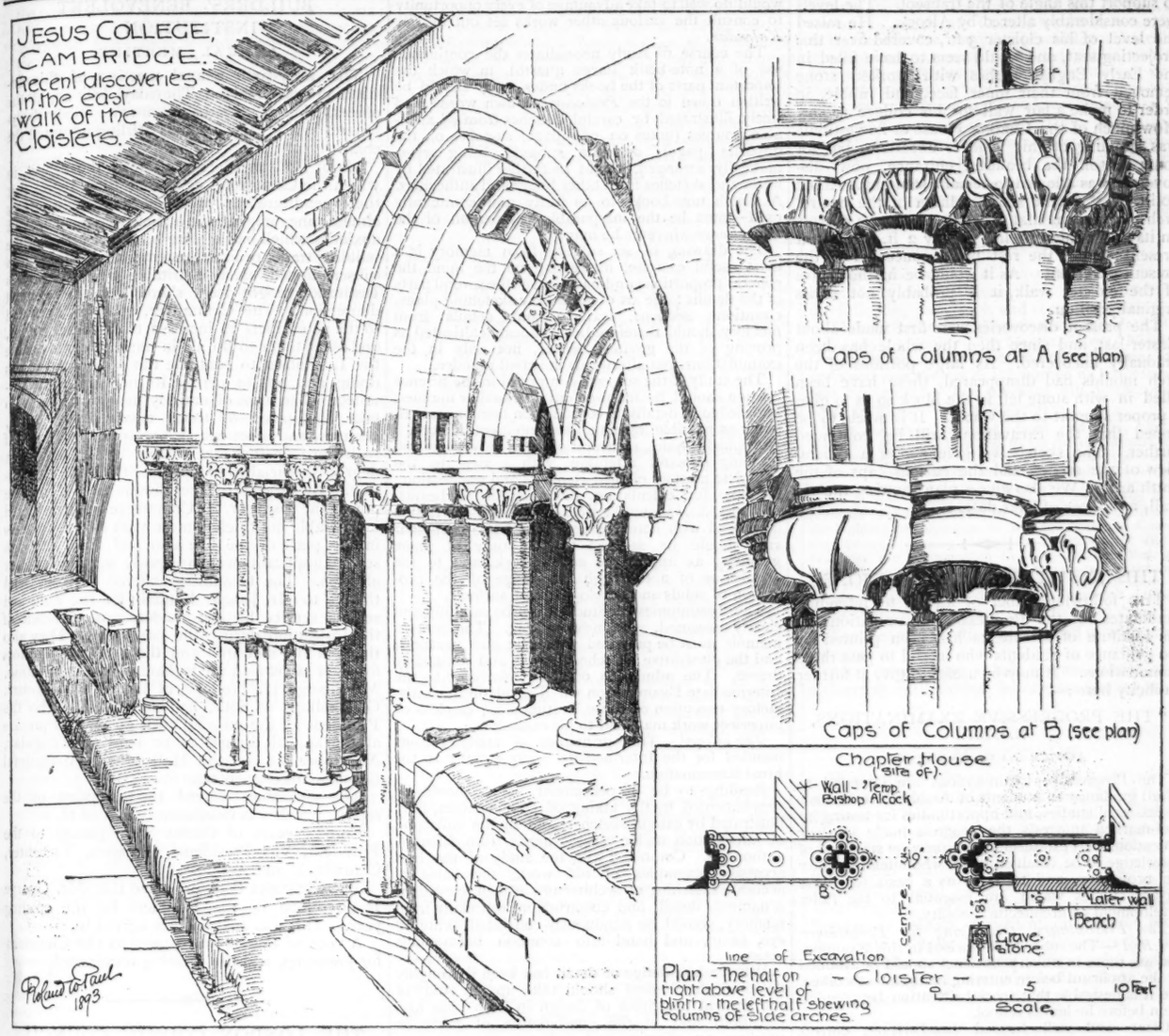
THE ROYAL ARCHÆOLOGICAL INSTITUTE AT SILCHESTER.

ON Thursday, July 20, a considerable contingent of the members of the Royal Archæological Institute who had been attending the London congress tarried for an extra day in order to visit Silchester and the excavations now in progress. A saloon carriage conveyed the party, about thirty in number, from Paddington to Reading. At Reading a considerable time was spent in the museum, which has been specially fitted up and considerably enlarged in order to receive (with the consent of the Duke of Wellington and the Society of Antiquaries) all the Silchester discoveries, which are deposited there at the end of each season. A small room is set apart for the important architectural fragments, and for the various models of different parts that have been so carefully prepared by Messrs. Hope and Fox. Against the wall hangs a large plan of the city, upon which are marked to scale the various discoveries and ground-plans as they are uncovered. We would suggest that the date should be clearly marked as each addition is put upon the plan. In this room Mr. G. E. Fox, F.S.A. gave a comprehensive sketch of the history of Silchester, and conclusively showed the great importance of the systematic investigation now in progress, particularly in the bringing to light architectural details which tell far more of the life of England under the civilising sway of the Romans than do bits of pottery, bronze, or iron, for these, however valuable and interesting as details, can only speak incidentally of manners and customs. "We can judge," said Mr. Fox with epigrammatic truth, "far more of a man from the house in which he lives than from the tea-pot which he uses." Three models, all of them on the scale of $\frac{1}{2}$ inch to the foot, occupy the centre of the room, one being of the important west gate, another of a typical house of the smaller class, and the third that of the Christian church discovered last season, and which has recently been put in position. Round the walls are placed the great Corinthian capitals from the columns of the first basilica, a half capital of the Doric order found at the south gate, a tablet of Purbeck marble with the beginning of an inscription, the base of a column of the ambulatory of the former, and some smaller columns, which were either from colonnades of the former, or formed part of some ambitious architectural ornamenting of the larger houses. A piece of Roman roofing has been ingeniously reconstructed from squared stone shingles arranged in a diamond pattern. There are also various examples of roof tiling, of square flue tiles from hypocausts, of fragments of Purbeck and foreign marbles for wall lining, and of plaster painted in various shades and patterns. The small Mosaic centre of a pavement has also been moved here, and there are also several varieties of *opus signinum*, a hard concrete formed of various materials, the surface of which is ground level and polished for pavements.

In a much larger room is a wondrously varied collection of the detailed finds of the last three seasons, including every variety of Roman pottery that is known, such as the black coloured ware intermixed with small grains of powdered flint, resembling the earlier Celtic pottery, every variety of Samian and pseudo-Samian, as well as vases and fragments from the Medway, Caistor, Salop, New Forest, and other English kilns. Objects of bronze, bone, glass, leather, and iron covered the walls and table-cases in endless variety. Of the remarkably large and diverse find of iron tools and instruments, the small hand anvils for driving into the ground, and hammering out thereon the scythe of the mower, attracted the most attention. These were discovered last year and excited much attention, and not a few more or less wild conjectures as to their use. But last winter it was ascertained that these small anvils, of almost identical pattern, are still being manufactured in Birmingham for use in southern Europe and in the Spanish settlements of South America. Colonel le Cornu remarked that they need not go so far afield for their use, as they were used at the present day on his estates in the Channel Islands by the French mowers who came over from Normandy and Brittany.

A drive of some ten miles brought the party to Silchester. Here the general condition of the great walled city, and the result and nature of the excavations were explained by Messrs. Fox, Jones, and Mill Stephenson, as many of the members of the Institute were making their first visit. There is no need, however, to reproduce in these columns, even in the briefest way, the remarks on the past excavations, whether of the great basilica and forum in the 'sixties and 'seventies, or of the more systematic work of the last two years. We will content ourselves with the work done during the first half of the season of 1893, which has not so far been in any way chronicled. Immediately to the south of the central insula containing the great civic buildings of the city is a circular building which was excavated by Mr. Joyce some twenty-five years ago, and was pronounced to be a temple. It has within it another circular wall or building, so that the outer wall inclosed a corridor or passage round the inner one. This arrangement of one building within another corresponds with the two square temples that were found near the east gate. This circular building has now been again exposed, and to a greater depth, and with greater care than was used in its first unearthing. It is to be carefully planned out and further examined. It seems likely that its probable use for Pagan worship or for a Pagan shrine will be confirmed; nothing corroborative of the theory that it may have been a Christian baptistery, which was first propounded by Professor Freeman, has as yet been discovered. Not far from this, on the south side of the city, considerable excavations have been made that cover the whole of one insula or square, and considerable parts of another. Much of this space, though closely intersected with trenches, has brought nothing to view save occasional finds of small objects and fragments. It has probably been garden ground, or else very thoroughly cleared for subsequent building purposes. In one angle however of the insula, a typical example of a house of the larger size has been uncovered throughout, and it presents so many characteristic features that Messrs. Fox and Hope have decided to reproduce it in half-inch model. A courtyard with corridors forms a centre round which the rooms are placed, and these again have a kind of external corridor broken up into smaller rooms. The hypocaust for the warming of the winter parlour is the best and most perfect of its kind that has yet been uncovered. The corridors are neatly paved with inch-square tesseræ of red tile. Some of the rooms have had squares of mosaic patterns, whilst others are effectively floored with tesseræ of a grey colour made from sandstone bordered with deep blue tessaræ of overbaked tiles. The atrium, triclinium, and usual set of rooms can readily be distinguished. Several of the floors bear evidence of rude patching with large tiles and stones, which was probably done during the period when the city was sinking into gradual decay, as the Roman withdrawal became more and more imminent.

A good deal of sorrow was expressed by the visitors, who were not here last year, at the covering over with soil of the site of the small Christian church or basilica, upon the surface of which there is now a good crop of mangels; but it is the best way of keeping out the frost. Those who have closely studied the question, no longer have any doubt as to its being really a Christian


JESUS COLLEGE, CAMBRIDGE.
Recent discoveries in the east walk of the Cloisters.
Caps of Columns at A (see plan)
Caps of Columns at B (see plan)
Chapter House (Site of).
Wall - Temp. Bishop Alcock
A
B
Later wall
Bench
Grave stone.
line of Excavation
centre
Plan - The half on right above level of plinth - the left half shewing columns of side arches
- Cloister -
5
10 Feet
Scale.
Roland to Paul 1893

church, and speak with the utmost certainty. They have also much hope of finding one or two more churches within the area of the city before the work of excavation is finally accomplished.

A large variety of finds in pottery, glass, bone, bronze, &c., discovered in the last eight or nine weeks are now heaped up in the temporary wooden receptacle close to the present diggings. We noticed several vases of much elegance, some flue tiles with handsome and hitherto unnoticed patterns on the side that would be left exposed in the inner walls, and a fine example of a bronze finger ring, to which a folding key was attached. But the two most noteworthy finds are two large square Roman bricks or tiles. On the reverse on one of these is a rude but spirited drawing, done whilst the tile was yet soft by some 'prentice hand, of a cow or ox, doubtless an example of the now extinct *bos longifrons;* on the back of the other tile was some rude lettering, possibly mere alphabet practising, which must be left to Mr. Haverfield, or some like expert to unravel.

There have also been some slight excavations on the north side of the city, but so far with no special results. Tea in the Church Barn, near the east gate, brought a pleasant sunny day to a close.

NEW STREETS AND BUILDINGS BYE-LAWS AT CARDIFF.—A special meeting of the Cardiff Corporation Public Works Committee was held at the Town-hall on the 17th inst. for the purpose of considering the draft of the revised bye-laws relating to new streets and buildings. Alderman Daniel Lewis (the deputy-mayor) presided, and there were also present Alderman Fulton, Mr. W. Harpur (Borough Engineer), Mr. Cornish (deputy-clerk), and others. The alterations in the bye-laws chiefly referred to alterations in the thickness of walls, scantlings, roof timbers, joists, and beams. The Committee, after carefully examining the draft, agreed that the Council be recommended to adopt the bye-laws as to the alteration of buildings, and forward the same to the Local Government Board for provisional approval.

DISCOVERIES AT JESUS COLLEGE, CAMBRIDGE.

ADDITIONAL interest has been recently given to the already interesting group of buildings of Jesus College, Cambridge, by discoveries which have been made in the east wall of the cloister. The present chapel was originally the church of the Nunnery of St. Rhadegund, and is still largely composed of work of the Norman and Early English periods. The north transept is chiefly of the former style. Considerable alterations and additions were made by Alcock, Bishop of Ely, who transformed the nunnery into a collegiate establishment. To the north of the present transept is a passage, now leading to the new quadrangle of the college, and probably standing on the site of either a sacristy or slype. To the north of this are college-rooms in two stories, built by Alcock. It is in this portion of the east wall of the cloisters, between the passage and the north-east angle, that the discoveries have been made. Traces of carved work were found on removing the plaster from the wall at this point, and further search has led to the finding of three very beautiful Early English arches, which formed undoubtedly the entrance to the vestibule of the chapter house from the cloister. The arches are of equal span and height, the centre one being a doorway, the side ones subdivided by lesser arches into two lights with openings in the head. The mouldings of the arches are of three orders, very boldly treated. The arches rest on groups of clustered columns arranged round a pier 11 in. square (see plan), the shafts of the doorway being banded about midway between cap and base. The side arches are closed by dwarf walls at this level in the usual manner. Some of the caps have the usual conventional carving of the period. Others, again, are left plain, doubtless intentionally, to show off those that are carved. Two caps on the northern respond claim attention from the curious character of their carving, which strongly resembles the classic egg and tongue ornament. Those facing them are also unusual (both these groups are shown in the sketches). The opening in the head of the southern arch, above the lesser arches, is elaborately ornamented with dog tooth and other ornaments. The corresponding opening on the north arch is simply moulded, with a row of small holes on the soffit, which seem to be original. The inner face of this wall has been treated in a similar manner, but the arches have had some of the outer order removed so as to form a smooth surface for the later room. The whole of this has not been cleared out, but sufficient remains to enable the width of the vestibule to be determined pretty accurately. It was about 21 ft. in width.

There are very distinct evidences in this fragment that it is not all of one date. Two materials have been used, clunch and Barnack stone. The whole of the arches, the carved portions of the caps, the square piers which the columns surround, and the dwarf walls of the side bays are of the former, while Barnack stone has been used for the abaci (the upper member only) the detached shafts, the bands, bases and plinth. One base, however, of the north respond is of clunch, and the group of bases of the south respond. These show very delicate mouldings, quite different in execution to the rougher work in the bases made of Barnack stone, which have evidently been inserted at a later period, possibly owing to the failure of the clunch to withstand the weight above it. The dwarf wall on the south side of the doorway is thickened a few inches, bringing it out to the present wall-face, and against this is a stone seat projecting 10 in. from the face of the wall. At first sight this fragment has an early appearance, and is in line with the Norman wall of the transept, which forms the wall of the present cloister south of the "slype" doorway. From the fact, however, that the plinth moulding of the Early English work is carried behind it, it seems obvious that this portion of the wall is a later addition, and may possibly have formed a buttress

to support this angle of the transept. The levels were considerably altered by Alcock. He raised the level of his cloister 3 ft., covered over this projecting seat, and would seem to have filled in the Early English arches with worked stone removed from their inner face, and rubble, in order to make a fair wall for his college rooms. How much of the Chapter House or its vestibule was standing at this time is uncertain, but for some reason the beautiful entrance, now discovered, was allowed to remain standing. About 20 in. west of the south column of the central arch is a monumental slab (see plan) with a cross on its upper side in relief. Only 2 ft. of it is at present visible, the rest being concealed by the present pavement. As it would be in the centre of the cloister walk, it is probably not in its original position.

The present discoveries were first made about Easter last, and since then the whole has been gradually uncovered. As large portions of the arch moulds had disappeared, these have been filled in with stone left in the block so as to give a proper support to the whole. It is much to be hoped that the excavations will be continued further. The sketch we give shows a general view of the arches, and the curious caps of the north arch. We also give a plan showing the old wall, and those of later date.

THE INSTITUTE EXAMINATIONS.

THE following paper of advice to intending candidates for the Progressive Examinations of the Institute of Architects has been printed for the guidance of students who intend to pass these examinations. It may be useful to give it further publicity here :—

"THE PROGRESSIVE EXAMINATIONS, R.I.B.A.

ADVICE TO CANDIDATES.

The Progressive Examinations are intended to afford guidance to students of Architecture in their professional studies, and opportunities for testing at well-marked intervals the progress made in their education, thus establishing a *minimum* standard of knowledge to be attained by all who intend to enter the profession, and to serve as a basis for those further studies which are essential to the fuller development of architectural ability.

The Preliminary, Qualifying for Probationer R.I.B.A.—The subjects comprised in this Examination are those in which proficiency should be attained by the applicant before entering an architect's office, and it is desirable that special attention be given to them before he leaves school.

Clear and well-formed handwriting, correct spelling, grammar, and punctuation are indispensable.

Powers of observation and of graphic description, facility of composition and lucidity in the expression of ideas, should be carefully cultivated, as being of the utmost value in the prosecution of further studies, and in the work of later years.

Arithmetic, algebra, and plane geometry should be familiar to the candidate, and a knowledge of their application in the solution of simple problems in elementary mechanics and physics should be acquired.

The geography of Europe and the history of England from the Norman Conquest to the end of the Tudor dynasty should be well studied, regard being had to the connexion between the history of the country and its architecture.

A good knowledge of French is essential, and of German or Italian very desirable, and a clear understanding of the Continental metrical system will also be useful.

Geometrical drawing and the elements of perspective are indispensable subjects of study, and should receive particular attention; while freehand drawing with rapidity and precision from the cast and the antique, and sketching with accuracy, should be carefully cultivated. Reasonable proficiency in these subjects is of the first importance.

The Intermediate, Qualifying for Student, R.I.B.A.—The first aim of the *Probationer* should be to acquire facility and accuracy in the geometrical and perspective drawing of architectural subjects, commencing with the Orders and the several periods of Mediæval Architecture, drawn out to a large scale and from figured dimensions.

This course should be followed by careful study of the ornament appropriate to each style, the enrichments of the mouldings being drawn full size, and sketched and measured, as far as possible, from actual work.

A good general knowledge of mouldings and details having been thus acquired, their practical application should be matured by the measurement of good examples of actual work, and by the making of fully figured and detailed drawings therefrom, with details full size.

The elementary principles of Classic and Mediæval Architecture may be gleaned from the books mentioned in the Programme, but the *Probationer* would do well to take advantage of every opportunity to consult the various other works set out in *The Kalendar*.

The course of study necessitates the continuous use of a note-book (large quarto), in which the important parts of the books under study should be written down in the *Probationer's* own words, and freely illustrated by careful sketches from all available sources (notes on one page, sketches on the opposite page); and the subjects, being systematically arranged, might be further illustrated by notes and sketches from other books and authorities. A sketch note-book—to be freely and continually used—must be the inseparable companion of the *Probationer* wherever he may go.

The drawing of set subjects from memory is a most useful exercise, impressing on the mind the general proportions and harmony of the several parts of the details: the art of accurately sketching plans, elevations, sections, features and details from memory should therefore be sedulously cultivated as proving of the greatest service, not only in the examinations, but afterwards in actual practice.

The study of the subjects comprised in the Science Section should be followed out in a similar manner, knowledge of details of construction being acquired, as far as possible, by actual measurement of work.

Applied physics, mensuration, land surveying, and levelling demand attention, with a view to the complete mastery of their elements and application; formulæ for calculating the strength of beams, columns, &c., should be worked out and the results compared with actual experience; while particular care should be devoted to the study of plane geometry as applied to actual work, and to the acquisition of a thorough knowledge of the projection of solids and development of surfaces.

The Testimonies of Study must be carefully and clearly executed, with neat writing. The written memoir must be prepared with care and neatness, and the illustrative sketches be well and accurately drawn. The admission of the *Probationer* to the Intermediate Examination will depend on the satisfactory execution of these Testimonies; careless or imperfect work may lead to his exclusion.

The Final.—The principles of study recommended for the Intermediate apply equally to the Final Examination.

Reading to be of permanent value should be supplemented by the taking of copious notes, fully illustrated by careful sketches, and by the collection of information under various heads from different authorities. Combined with the study of the best accessible examples of old work, the habit of accurate sketching of architecture in plan, elevation, ornament, detail, and construction, especially from memory, should be assiduously cultivated, bringing eye, brain, and hand into common harmonious action.

When a knowledge of detail has been thoroughly acquired, the *Student* should take up the study of the general principles of design in both plan and elevation, and of the combination of parts to produce an effective and well-proportioned composition.

He should also master the principles and practice of the preparation of contract and working drawings and specifications, with the control of actual work, thus qualifying himself to deal with the ordinary and many of the difficult problems which arise in the designing and carrying out of modern buildings, and should miss no opportunity of visiting buildings in the course of erection.

As in the Intermediate, the admission of the *Student* to the Final Examination will depend on the sufficiency and excellence of the Testimonies of Study; poor composition, careless or imperfect execution leading to disqualification.

The books mentioned in the programme will supply the student with necessary information, but he is urged to take advantage of every opportunity to consult other standard works, the titles of which will be found in the *Kalendar*.

The *Student* having passed the 'Final' should have acquired a solid groundwork of knowedge, on which he may proceed with those more advanced studies in design and construction, proficiency in which will qualify him to engage in successful practice as an architect.

Should the *Student* desire special advice, the chairman of the Board of Examiners will be glad to receive him by previous appointment, and render him assistance in the removal of his difficulties.

ARTHUR CATES.

9, *Conduit-street, Hanover-square, London, W.*
July 20, 1893."

ALL SAINTS' CHURCH, NORTH PECKHAM.—In reference to the list of tenders for this building, published in our issue for July 15, the architect, Mr. W. Planck, writes to us that Mr. Kingerlee, one of the builders who tendered, complains that his reputation is somewhat suffering, as he appears to be by that list the lowest competitor and was not accepted. Mr. Planck writes to explain that the estimate was in three sections for this work, two only of which could possibly be accepted, and Messrs. J. Smith & Sons were the lowest on these, although Mr. Kingerlee was the lowest on the whole three taken together.

BUILDERS' BENEVOLENT INSTITUTION:

ANNUAL MEETING.

THE forty-sixth annual meeting of this Institution was held on Thursday, July 20, at the offices, No. 35, Southampton-row, Bloomsbury-square, W.C. Mr. Thomas Stirling occupied the chair.

Major Brutton (Secretary) read the report, in which the Committee expressed their regret that the expenditure had exceeded the income. This circumstance might have arisen from the increased anxieties which had of late been attendant on the building trade, or from the temporary falling-off in subscriptions to many charitable objects, and this Institution might have shared in the general depression. The Committee, however, appealed to the subscribers to increase their subscriptions, and asked them to do all in their power to enable the Institution to continue the good work it was doing, and not to permit its benefits to be curtailed. The want of entirely new subscribers to take the place of those removed by death, changes, and other causes, was greatly felt, and if such were obtained, they would be in the highest degree beneficial to the prosperity of the Institution. By reason of the diminution of income during the past year, the Committee had considered it advisable not to elect more than two pensioners in the place of the five who had died, although several applicants were anxiously waiting for their election. The Committee offered their grateful thanks to Mr. Joseph Randall for the able and zealous service he had rendered as President of the Institution during the past year. They also thanked the stewards and the honorary auditors for their labours in the welfare of the Institution. Mr. George H. Trollope, of the firm of Messrs. G. Trollope & Sons, had consented to be the President for the ensuing year, and would preside at the annual dinner, to be held on Thursday, November 23, in the Hall of the Worshipful Company of Carpenters.

The Chairman moved the adoption of the report, which was unanimously agreed to.

Cordial votes of thanks were passed to the President, Vice-Presidents, Trustees, Treasurer, Committee, and Auditors.

The Chairman then proposed that Mr. George H. Trollope be the President for the ensuing year. This was unanimously agreed to.

A vote of thanks was passed to the Chairman for presiding, and the meeting terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon last at Spring-gardens, the Chairman, Mr. John Hutton, presiding.

The Chairman's Annual Address.—The Chairman, in accordance with the annual custom, gave a review of the past year's work of the Council. The address contained a great deal of interesting matter, but as it has been published in full in several of the London daily papers, we need only refer to those paragraphs which will be of special interest to our readers.

After giving some particulars of the proposed reconstruction of Vauxhall Bridge (see the *Builder* for October 1, 1892), Mr. Hutton remarked that the Bridges Committee wished to remind the Council that the existing carriage way of Waterloo Bridge being only 27 ft. 4 in. wide, the important question of altering this bridge to provide for the growing traffic would have to be considered at no distant date. He hoped that the Council would not seek to effect this improvement by any false economy marring the beauty of this magnificent structure. Anything in the form of cheap ironwork would, he felt sure, meet with general disapproval. The address also contained the following paragraphs amongst others:—"The important works of the Blackwall Tunnel are making progress, and the members of the Council at a recent visit will have realised something of their extent and the special interest attaching to them. The four shafts are in course of erection, and the total value of the work executed to the end of the year has been estimated at 97,600*l*. . . . . The year's dealings with regard to claims incident to the construction of the Tunnel amounted to 130,743*l*., which after negotiations were settled for 81,660*l*. The space at the landing stairs at Blackwall has been increased by 25 ft., making a total width of 50 ft. Although the General Powers Bill of the Council stands in a sadly attenuated form, after a long contest before the Committee of the House of Commons, the clause providing compensation to workmen who may be injured in the construction of the Blackwall Tunnel under compressed air stands part of the Bill. I sincerely hope that no cases for compensation will arise, but it will be a source of satisfaction to all concerned that the Council has

the power to deal justly and properly with claims of such a nature should they arise. The approaches to Woolwich Ferry have already proved too narrow for the greatly increased traffic, 3,084,352 passengers and 251,929 vehicles having used the ferry during the year. A roadway of 60 ft. in width is, therefore, about to be formed. . . . The Building Act Committee . . . . has dealt with a large number of cases of lines of frontage and formation of streets, the total length of which, sanctioned by the Council during the past year, is nearly nine miles. The numbers of nearly 6,000 houses have been re-arranged, and no less than 3,828 dangerous structures have been condemned. Magistrates' orders have been obtained against owners of property in 481 cases, and like orders against occupiers of property in sixty-four cases. The work of amending and consolidating the building law is still under the consideration of the Committee. . . . . The work of the Improvements Committee and the progress of improvements has not been of a startling character. If ever there was an occasion that justified the Council holding its hand, that occasion, after the Council's numerous resolutions upon the subject, is the present. It would have been a great weakness if the Council had determined to proceed with a large improvement like, for instance, the Strand scheme, before a more equitable system of local taxation had been instituted. The Council continues to rely upon the Government finding new sources of revenue in addition to the readjustment of the amount of Exchequer contributions which have in the past been so stingily granted to London. London will be righteously indignant if her claims are neglected, and London improvements have to wait an indefinite time. It is, however, far better that the Council should get its source of revenue first and dispose of its income afterwards. The Council will no doubt avail itself of the opportunity of reconsidering the line of the proposed street from Holborn to the Strand, for the opinion is gaining ground that the last proposal before the Council contained the maximum of cost with the minimum of advantage. . . . . Although the work of the Main Drainage Committee does not appear to the casual observer to be of a character to invite attention, yet it is of vast importance to London that those onerous and important duties should be ably and efficiently carried out. The total capital expenditure on main drainage works from their creation has been 7,466,222*l.*, and the annual expenditure for maintenance is 194,765*l.* It has been the good fortune of the Council to attract to the service of the Main Drainage Committee men of singular and pronounced aptitude for the duty. Mr. Macdougall is the present capable occupant of the chair. The improvement in the pumping stations has not only reduced floodings in low-lying districts, but it has tended to make possible the efficient cleaning of the river by enabling the precipitation operations to be carried on with something like the application of scientific skill. The new precipitation works at Crossness were completed and put in operation in the second week of June. Since that time the whole sewage flow has been treated, the same method of treatment being adopted as at the Barking outfall on the north side, and no discharge of crude sewage into the river now takes place. Taking the two outfalls together, the sewage treated last year amounted to nearly 64 billion gallons. The amount of sludge obtained stands at no less than 1,785,700 tons. The whole of this quantity has been conveyed to sea by means of five huge vessels. The result has been that the river is generally admitted, by all persons competent to judge, to be in a better state than it has been for many years, especially in the lower reaches. The proposal made by some irresponsible persons that the only solution of the drainage difficulty is to be found in dividing the rain water from the sewage is of little practical value. It would cost twenty millions sterling to carry out such a system, and if it could be justified on financial considerations experts doubt very seriously whether it could be defended on sanitary grounds. A new school has been built at Crossness Station for the use of the children of the *employés* who live on the works. The tenders which were received for the erection of the school were so much above the estimate of the Architect that the Council did not feel justified in accepting any one of them. The work has been executed by men directly employed by the Council, with a most satisfactory result. . . ."

On the motion of Dr. Collins, it was resolved that the Chairman's address should be printed and circulated.

The Electric Light in St. Pancras.—The Finance Committee brought up a report containing the following paragraph and recommendations :—

"We have also considered the application of the Vestry of St. Pancras for the loan of 30,000*l.* for electric lighting works, repayable by annuity in 42 years. The Council has already sanctioned loans for 10,000*l.* for the purchase of a site, repayable in 50 years, and 60,000*l.* for works, repayable in 42 years. The 10,000*l.* was advanced by the Council, and the 60,000*l.* borrowed elsewhere, as the Council had no power at that time to lend for a longer period than 30 years. This restriction was, however, removed by section 7 (iv.) of the Money Act of 1892, and the term of 50 years fixed as the maximum limit. The Vestry state that beyond the sum of 70,000*l.* above referred to, they have expended or propose to expend the further sum of 30,000*l.* on the following works :—Land, 524*l.* 9s. 3d. ; buildings, 3,276*l.* 2s. 4d. ; boilers, &c., 943*l.* 0s. 4d. ; engines and dynamos, 1,853*l.* 7s. 5d. ; switchboards, 57*l.* 4s. 1d. ; batteries, 215*l.* 14s. 11d. ; trenches, 6,166*l.* ; electrical conductors and sundry works, including royalties (and 8,000*l.* for public street lamps), 16,964*l.* 1s. 8d. ; making a total of 30,000*l.* We are informed that the plans of some of these works have not been approved by the Council, and others have been constructed outside the limits of supply of the vestry. The total cost in respect of which the plans have been approved amounts to 75,435*l.*, in respect of which a loan of 60,000*l.* was sanctioned repayable over 42 years, without reference to the life of the work. This will reduce the amount of the loan now to be granted to 15,435*l.* If regard is had to the life of the work, as has previously been done in loans made by the Council, the amount expended would be spread as to 47,344*l.* over 30 years, 23,610*l.* over 15 years, 1,984*l.* over 8 years, and 2,497*l.* over 5 years, leaving the sum of 15,435*l.* now to be dealt with to be spread, as to 10,954*l.* over 15 years, 1,984*l.* over 8 years, and 2,497*l.* over 5 years. It is, however, contended that the whole of the outlay should be treated as initial cost, and placed on a similar footing as an investment of capital by a public company, the necessities of the case requiring that the whole of the plant and machinery should be kept in perfect condition to perform the work required, and that the cost of maintenance and renewals will be borne by the receipts in aid, or out of the general rate of the parish. We think that there is considerable force in this contention, and that the Council may reasonably be asked to assist the vestry in the development of this new system of lighting the parish. We think it desirable, under the circumstances stated, to submit two recommendations (*a*) for the Council to sanction the borrowing of 15,400*l.* for the period of 42 years only, and (*b*) should they see no objection to departing from the previous practice of limiting the loan to the life of the work, both to sanction the loan and also lend the money. We recommend—

(*a*) That the sanction of the Council be given under seal to the borrowing by the Vestry of St. Pancras of the sum of 15,400*l.* towards defraying the cost of certain electric lighting works, at a rate of interest not exceeding 3*l.* 10s. per cent. per annum, to be repaid either by the annuity or instalment method, within a period of forty-two years from the date of the loan.

(*b*) That, subject to the Council hereafter giving its written consent under seal to the borrowing, and subject to all necessary consents and evidence being furnished to the satisfaction of the Solicitor of the Council, the application of the Vestry of St. Pancras, for a loan of 30,000*l.*, towards defraying the cost of electric lighting works in the parish be granted, to the extent of 15,400*l.*, on condition that the loan be taken up at once, interest being charged thereon at the rate of 3*l.* 10s. per cent. per annum, calculated quarterly, and with the principal being repaid by such equal half-yearly payments of principal and interest combined as will repay the amount borrowed within a period of forty-two years ; that it be referred to the Solicitor to take the necessary measures for completing the loan, and that the amount be advanced out of the Consolidated Loans Fund."

The consideration of these two recommendations gave rise to considerable discussion, but ultimately they were agreed to.

Paving and Sewerage Works, &c.—The Council, on recommendations by the same Committee, agreed to lend the St. Pancras Vestry 5,600*l.* towards granite paving, and 24,000*l.* for wood-paving ; the Strand District Board 7,000*l.* for wood and asphalte paving works ; the Shoreditch Vestry 5,900*l.* for sewerage works at Haggerston ; the Battersea Vestry 3,000*l.* towards defraying the cost of opening up the Shaftesbury Park, the Beaufoy, and the Queen's-road estates, Wandsworth ; 5,100*l.* for sewerage works in various streets in the parish ; and 2,300*l.* towards certain street improvements.

Appointment of Comptroller.—On the motion to appoint Mr. H. E. Haward Comptroller of the Council, at the commencing salary of 700*l.*, rising to 1,000*l.* a year, several amendments were proposed and rejected, and the resolution was passed.

A Statistical Department.—It was also resolved, on the recommendation of the General Purposes Committee, that there should be formed a Statistical Department, and that Mr. G. L. Gomme should be appointed Head of the Department at a salary of 600*l.*, rising to 700*l.* a year by two annual increments of 50*l.*

Proposed acquisition of Lincoln's-inn-fields.—The Parliamentary Committee's report contained the following paragraph and recommendation:—

"We have considered the resolution passed by the Council on the 13th June referring back to us our report recommending the re-introduction of the Bill relating to Lincoln's-inn-fields, with instructions to consider whether the Bill should not be amended, in view of the decision of the Committee of the House of Lords to strike the clause relating to Lincoln's-inn-fields out of the Open Spaces Bill of the present session. We have consulted the Solicitor and the Parliamentary Agent, and are advised that the way in which the Council would be most likely to be successful in obtaining possession of Lincoln's-inn-fields as an open space for the public would be by seeking compulsory powers of acquisition under the terms and provisions of the Lands Clauses Acts. We concur in this opinion, and recommend—

That we be instructed to prepare a bill for the compulsory acquisition of Lincoln's-inn-fields under the provisions of the Land Clauses Acts, and that communications be made to the Benchers of Lincoln's-inn and the trustees of the gardens indicating the intentions of the Council, and asking for any observations which they may have to make thereon, and also inviting them to enter into a conditional contract for the sale of the area within the square."

The recommendation was agreed to.

Proposed Theatre, Fulham-road.—The Theatres and Music Halls Committee's report contained the following paragraph and recommendation :—

"We have considered seven drawings, dated 11th July, 1893, submitted by Messrs. Essex, Nicol, & Goodman, on behalf of Mr. Rollo Balmain, for a proposed new theatre at the corner of Fulham-road and Epple-road. The premises will accommodate 1,041 persons. We recommend—

That the seven drawings, dated 11th July, 1893, be approved, provided the access to the heating apparatus in the basement be altered so that the room can only be entered from the outside, and be separated from the space under the stage by a brick wall, or self-closing iron doors fitted in iron frames ; that upon the completion of the premises to the satisfaction of the Council, and subject to the building complying in all respects with the Council's regulations, and being carried out in accordance with the drawings, the Metropolitan Building Act, the Metropolis Local Management Act, and the Acts amending the same, a certificate under the Metropolis Management and Building Acts Amendment Act, 1878, be sealed and issued to the owner of the premises."

The recommendation was agreed to without discussion.

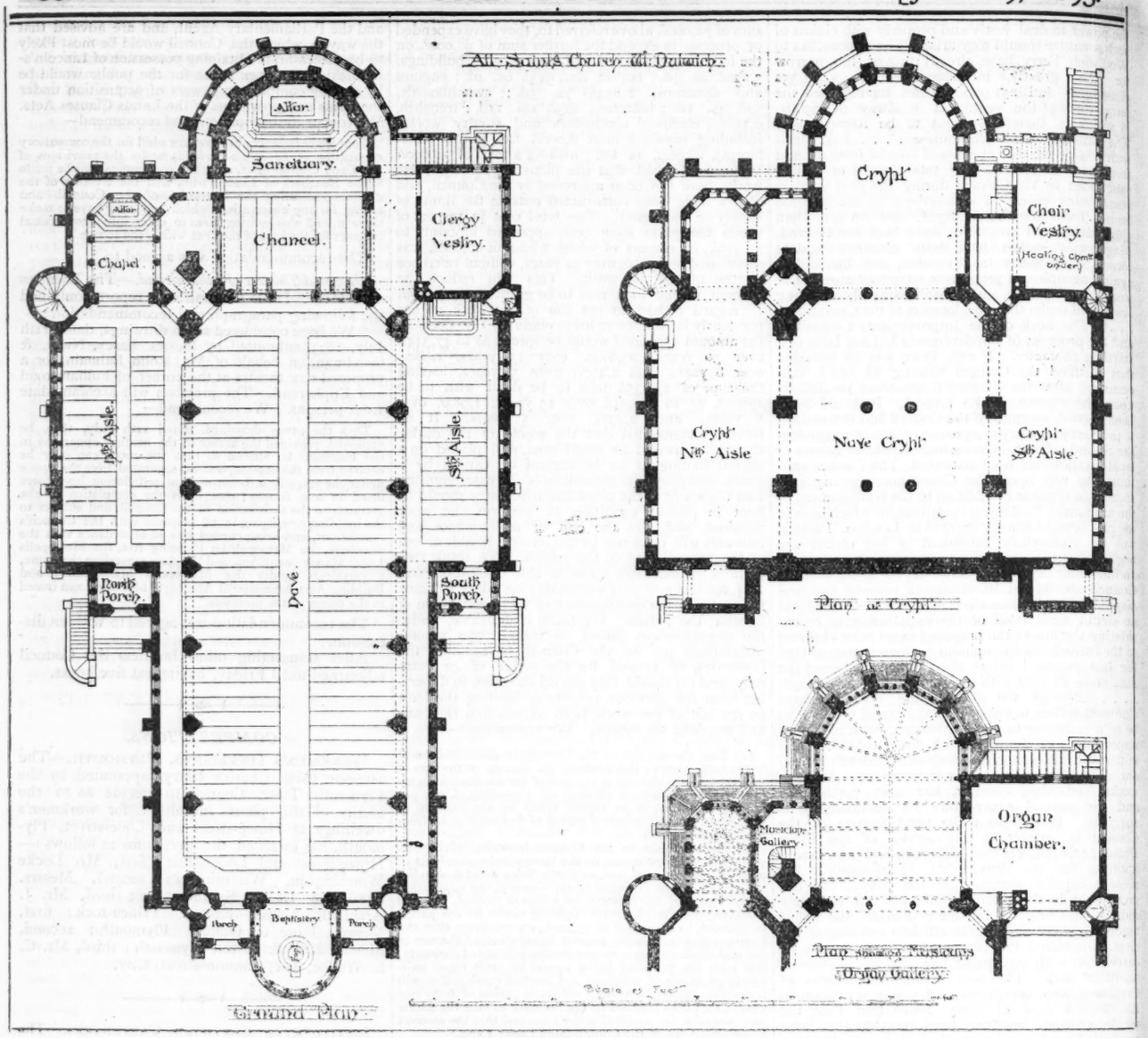
After transacting other business the Council adjourned until Friday, having sat five hours.

COMPETITIONS.

WORKMEN'S DWELLINGS, PLYMOUTH.—The assessor (Mr. Charles Barry) appointed by the Plymouth Town Council to decide as to the merits of the plans submitted for workmen's dwellings at Howe-street and Looe-street, Plymouth, has awarded the premiums as follows :—Howe-street and Looe-street : first, Mr. Locke Worthington, Westminster ; second, Messrs. Sanders & Lucas, Southampton ; third, Mr. J. Archibald Lucas, Exeter. Prince-rock : first, Messrs. Hine & Odgers, Plymouth ; second, Messrs. King & Lister, Plymouth ; third, Mr. C. S. Webbe, 101, Cannon-street, City.

INSTITUTE OF CERTIFIED CARPENTERS.—The first annual dinner of this Institute was held on Saturday last at Carpenters' Hall. The qualification for membership is that of passing the examinations held annually at Carpenters' Hall. The subjects for examination comprise :—"Timber, English, Foreign, and Colonial : Its Decay, Preservation, and Use" ; "Timber Roofs, also Composite Roofs" ; "Doors, Windows, and Ornamental Joinery" ; "The Setting Out and Construction of Staircases and Joints in Joinery" ; "The Framing and Construction of Partitions, Floors, and Temporary Structures." Professor Banister Fletcher, F.R.I.B.A., occupied the chair, and amongst those present were Mr. Henry Adams, M.Inst.C.E., Mr. Henry Angel, Mr. C. F. Mitchell (Master of the Carpenters' Company), and Mr. Stanton W. Preston. Among the toasts given was "Success to the Certified Carpenters," in replying to which the Secretary explained the origin of the Institute and its success, announcing that sixteen new member had joined during the past year. The President, in reply to the toast of his health, said that whilst the increase of the Institute must be limited, because the qualification was the passing of what has been called a stiff examination, still he was hopeful that gradually *all the trade* would pass the examination and so be eligible as members. He pointed out that there was a growing feeling that the method of work of the past fifty years—namely, the production of articles on which were expended the least amount of time and trouble—was departing, and that the new creed would be that every man would throw into his work earnestness and endeavour to produce the best work for the love of the work itself, and thus rival the splendid work the carpenters and joiners of the Middle Ages produced, and raise the trade to a higher and nobler standard.

PROPOSED IMPROVEMENTS AT DOUGLAS, ISLE OF MAN.—At the final sitting for the present session of the Manx Tynwald Court, on the 20th inst., leave was given to introduce a Bill to construct a swing bridge over Douglas harbour, at an estimated cost of 10,000*l.* This will bring Douglas into direct communication with Douglas Head. Votes were granted for extensive improvements at Laxey and Douglas harbour, so as to facilitate the entrance and berthing of larger steamers.



Illustrations.

THE SHAFTESBURY MEMORIAL FOUNTAIN, PICCADILLY-CIRCUS.

WE give a view of this fountain, the design of Mr. Alfred Gilbert, R.A., from a photograph specially taken for the purpose from the north-west part of Piccadilly-circus. The stone balustrade which encloses the fountain is omitted, as it would have been impossible, if including that, to get the fountain itself on a sufficiently large scale to form an adequate illustration.

On the general design of the work we have already commented (see page 25, *ante*). We may add here that we presume that the idea of the crowning figure with the bow, the meaning of which has given rise to a great deal of conjecture, was suggested by a kind of play on the first syllable of the word "Shaftesbury"—the archer discharging his "shaft" or arrow; but we have not the authority of the sculptor for this interpretation. It would serve sufficiently as an excuse for a figure the main object of which, after all, is to make a pleasing termination to the design and to introduce into it a feature of pure sculpture.

ALL SAINTS' CHURCH, WEST DULWICH.

THESE illustrations are from drawings of the original design made for the above-named church by Mr. George H. Fellowes* Prynne, in 1888, and since partially carried out for the Rev. James Beeby, Vicar. Quantities were supplied by Mr. R. Henry Hale, and tenders for the whole work were obtained. The funds being inadequate, it was determined to build the church in sections. The first contract included the foundations at the east-end, which were carried out by Messrs. Kynock & Co., the foundation-stone being laid on All Saints' Day, 1888. The second contract included crypt, chancel, chapel, vestries, north and south transepts, and three-and-a-half out of seven bays of the nave, the flèche and tower being, for want of funds, temporarily cut off at roof level. The second contract was carried to completion by the firm of Messrs. J. & C. Bowyer, of Upper Norwood.

The salient points of the design are as follows:—

The site has a fall of 28 ft. from west to east. The nave floor taking the western level, space is obtained for a spacious crypt for parochial uses, heating, and other purposes.

The main scheme of the church shows a lofty nave, 60 ft. high and 40 ft. wide and 128 ft. in length, divided into seven double-arched bays, the piers being built of red brick and stone. Panels for decoration are formed over lower arches, and a clearstory in spandrels above. Three eastern bays open into the north and south transepts. The chancel and sanctuary are the same height as nave, 28 ft. wide and 44 ft. in length.

The altar, which is elaborately carved and richly decorated in gold and colour, is 12 ft. in length, and is placed eleven steps above the nave floor level, and a good effect obtained, both externally and internally, by seven lofty windows at eastern end. Under these windows sixteen niches are formed in the brickwork, with carved stone brackets supporting statues of the twelve Apostles and various other saints, the figures being the work of Mr. J. E. Taylerson, sculptor. Beneath these figures are placed the sedilia, piscina, and aumbry. The dividing arch between the chancel and nave is enriched with tracery supported by two slender columns rising from the lower screen. A wrought-iron rood-screen spans the spaces between columns. The northern transept forms the nave of a chapel, the sanctuary of which is placed on the northern side of the chancel; clergy and choir vestries and organ chamber are placed on the south side of chancel. An ambulatory runs entirely around the east end of chapel and chancel, connecting the northern turret with the vestries. Space is obtained for a musicians' gallery between chancel and chapel, both of which it faces. As the means at the disposal of the architect were wholly inadequate to admit of a tower or spire of large dimensions, he has designed a kind of minaret tower, which, while it is in accordance with the feeling of the design generally, is sufficiently large to admit of a peal of bells. The tower is placed angle-wise to the building, the arches at the base by this means forming a double squint for the high and chapel altars.

An apsidal baptistery is placed at the west end, with porches north and south.

The church is heated by hot-water and small-bore pipes, by Mr. De Ridder.

At present the church has a somewhat cramped appearance, as only half the length of the nave is completely finished.

The present portion of the church will accommodate some 950 persons, and, when complete, about 1,400.

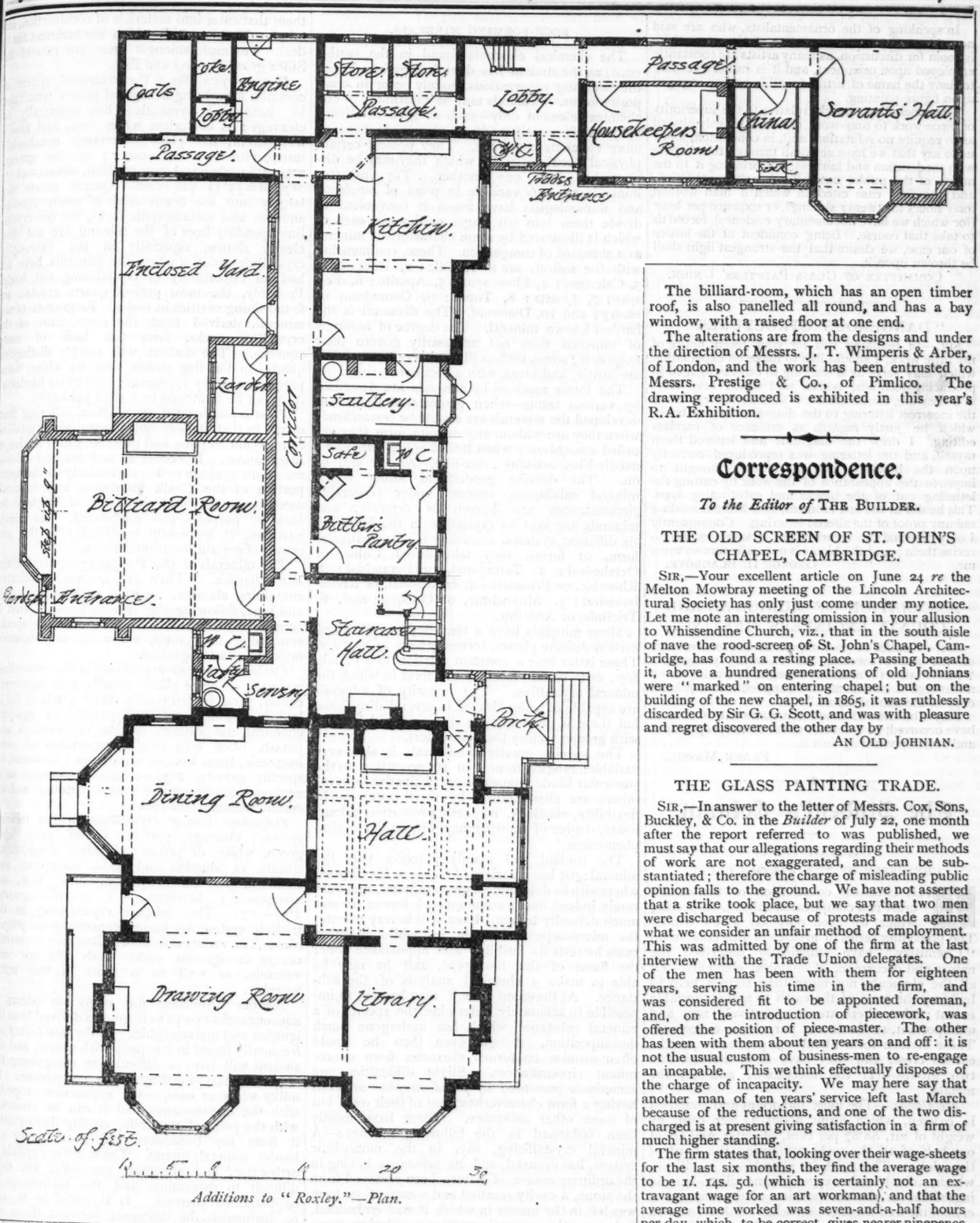
The total outlay of the present portion of the building has been nearly 13,000*l.* The estimated cost of completing the portions at present left unfinished is 5,000*l.*

* Not "Fellows," as erroneously given on the lithograph

COMPETITION DESIGN FOR OXFORD MUNICIPAL BUILDINGS.

THE design illustrated was one submitted in the preliminary competition.

The elevations and the details of the exterior were designed with the view that the building should be carried out in blush or flesh coloured



Additions to "Roxley."—Plan.

terra-cotta, the roofs being covered with green Westmoreland slating, the flat portions being covered with lead and the areas faced with white glazed bricks.

Internally it was proposed that the walls of the entrance-lobbies, hall, and grand staircase, and the greater portion of the internal walling of the town hall, council chamber, assembly-room, and front committee room should be finished in terra-cotta, the ceilings being covered with ornamental carton pierre, and the doors, panelling, gallery-fronts, and joinery-work generally being executed in oak, the flooring in these rooms being also of oak laid in narrow widths.

The steps to the grand staircase were to have been of marble, with terra-cotta balustrading.

The design is by Messrs. Cheston & Perkin, and the drawing is hung in the Architectural Room of the Royal Academy.

"ROXLEY," WILLIAN, HERTS.

THESE alterations, which consist more of conversions than of additions, are, in an amended form, now in course of execution.

The plan published herewith shows a long and straggling old house, the wing building having until now been formed by stables and coach-houses, which have been converted into kitchen offices.

This adaptation has dominated the external treatment, rendering it difficult to obtain anything like simplicity or uniformity in the front as a whole.

The materials used are red brick facings, with half-timber work above, and Broseley tiles for the roofs.

The hall, which runs up through two stories, is panelled in old oak, with a panelled oak gallery running along one side of it, and the ceiling is in oak in keeping with same.

The billiard-room, which has an open timber roof, is also panelled all round, and has a bay window, with a raised floor at one end.

The alterations are from the designs and under the direction of Messrs. J. T. Wimperis & Arber, of London, and the work has been entrusted to Messrs. Prestige & Co., of Pimlico. The drawing reproduced is exhibited in this year's R.A. Exhibition.

Correspondence.

To the Editor of THE BUILDER.

THE OLD SCREEN OF ST. JOHN'S CHAPEL, CAMBRIDGE.

SIR,—Your excellent article on June 24 *re* the Melton Mowbray meeting of the Lincoln Architectural Society has only just come under my notice. Let me note an interesting omission in your allusion to Whissendine Church, viz., that in the south aisle of nave the rood-screen of St. John's Chapel, Cambridge, has found a resting place. Passing beneath it, above a hundred generations of old Johnians were "marked" on entering chapel; but on the building of the new chapel, in 1865, it was ruthlessly discarded by Sir G. G. Scott, and was with pleasure and regret discovered the other day by

AN OLD JOHNIAN.

THE GLASS PAINTING TRADE.

SIR,—In answer to the letter of Messrs. Cox, Sons, Buckley, & Co. in the *Builder* of July 22, one month after the report referred to was published, we must say that our allegations regarding their methods of work are not exaggerated, and can be substantiated; therefore the charge of misleading public opinion falls to the ground. We have not asserted that a strike took place, but we say that two men were discharged because of protests made against what we consider an unfair method of employment. This was admitted by one of the firm at the last interview with the Trade Union delegates. One of the men has been with them for eighteen years, serving his time in the firm, and was considered fit to be appointed foreman, and, on the introduction of piecework, was offered the position of piece-master. The other has been with them about ten years on and off: it is not the usual custom of business-men to re-engage an incapable. This we think effectually disposes of the charge of incapacity. We may here say that another man of ten years' service left last March because of the reductions, and one of the two discharged is at present giving satisfaction in a firm of much higher standing.

The firm states that, looking over their wage-sheets for the last six months, they find the average wage to be 1*l.* 14s. 5d. (which is certainly not an extravagant wage for an art workman), and that the average time worked was seven-and-a-half hours per day, which, to be correct, gives nearer ninepence than tenpence per hour as an average.

The first man we mention was paid eleven pence per hour before the introduction of piece-work, and working fifty hours per week made his wage 2*l.* 5s. 10d., a difference in favour of the old system of 11s. 5d. on their own showing, and during the six months quoted 446½ hours of his time were given to photographic and shop work for which he was paid at the old rate, leaving, at 7½ hours per day, 723½ hours devoted to piece-work, for which he got 23*l.* os. 3½d., an average of 7⅜d. per hour, but as he made a point of putting in eight hours per day the average is reduced to 6⅝d.

The other man was in no better condition, and we again say that the specific alteration in price was made after the work was started, and the reason given was that the work had been underestimated; also the character of the work was not simplified and one man was told to do it exquisitely neat. The advances in prices given at different times and quoted at the meeting were not given in the spirit claimed, but in all but one instance were extracted with difficulty. In one case the men refused to take a job at the price offered, and were given an extra sovereign.

In speaking of the ornamentalists, who are said not to be artists in the true sense of the word, there is room for discussion, as many artists are constantly employed upon ornament, and it is rather sweeping to deny the name of artist to all but those engaged upon figure painting.

The concluding remarks relative to the superiority of piece-work to time-work are so obviously absurd as to require no refutation, and, in conclusion, allow us to say that we have acted all through this dispute with moderation and fairness, not bringing it to the notice of the public until all other attempts failed, and the final case cited, in which a man worked forty hours for twenty shillings, or sixpence per hour (for which we have documentary evidence), forced us to take that course. Being confident of the justice of our case, we desire that the strongest light shall be thrown upon it.

COMMITTEE OF GLASS PAINTERS' UNION.

"DANGEROUS STRUCTURES."

SIR,—In thanking you for your recent notice of my little work, I should like to make an explanation which may serve as a warning to others engaged in producing technical books, and which may also, in a measure, exonerate me. Your reviewer refers to the incorrect lettering to the diagrams in my book, which he justly regards as evidence of careless editing. I drew the diagrams and lettered them myself, and the lettering was reproduced correctly upon the blocks. But the printer thought to improve the appearance of the work by cutting the lettering out of the blocks and substituting type. This he did at the last moment, and without sending me any proof of the altered lettering. Consequently I only detected the errors when it was too late to revise them; and the blame is naturally thrown upon me.

GEORGE H. BLAGROVE.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS' MEETING.

SIR,—I notice in your report of the proceedings of the above meeting the following paragraph. "Mr. Massie (Wakefield) thought it would be an advantage if members were supplied with a printed copy of the annual report."

May I be allowed to say that some mistake must have occurred, as I did not speak on the proposition, and actually voted against it.

FRANK MASSIE.

The Student's Column.

GEOLOGY.—V.

CHEMISTRY OF THE EARTH'S CRUST.

THE chemical constitution of the earth's crust is a complicated subject, respecting which we need only say a few words. The preceding series of articles in this column on "Chemistry" have sufficiently described the nature and occurrence of chemical elements. Of all the elements, not more than sixteen help to build up the crust of the earth to any appreciable extent; the others are comparatively rare and unimportant, so far as our purpose is concerned. These sixteen form about 99 per cent. of the earth's crust, and they have been divided into two groups—(1) the metalloids, and (2) the metals.

Metalloids.—The most important and abundant is oxygen, which forms about 23 per cent. by weight of air, 88·87 per cent. of water, and about one-half of all the rocks composing the crust of the globe. The next in abundance is silicon, which, united with oxygen, forms silica—a main ingredient in the composition of the majority of crystalline and fragmental rocks. Other common metalloids are carbon, sulphur, hydrogen, chlorine, phosphorus, and fluorine.

Metals.—The metallic constituents of the earth's crust have largely entered into combination with oxygen. Amongst the metals we may enumerate the following elements, in order of their relative abundance:—Aluminium, calcium, magnesium, potassium, sodium, iron, manganese, and barium. Aluminium, in combination with oxygen, forms alumina, but its most common condition is in union with silica, in which form it constitutes the basis of a large variety of rocks. Calcium is most abundant in nature, in union with carbon dioxide, occurring as solid rock, or dissolved in water; in the latter state it is one of the most universally diffused mineral matters in rivers, lakes, and oceans. The other metallic elements play a much less conspicuous part in the constitution of the crust.

The three acids with which most of the bases have been combined are silicic, carbonic, and sulphuric; we shall have more to say respecting these in subsequent articles.

ROCK-FORMING MINERALS.

The chemical elements found in the earth's crust, as the student has doubtless gathered from the foregoing observations, mainly occur in composite forms. Minerals may be constituted of one chemical element only—such as gold or silver; but they are mostly made up of two, or three, or more elements combined. They possess certain physical peculiarities by which they may be distinguished from one another. For instance, minerals are very variable in point of *hardness*, and mineralogists have found it convenient to divide them into ten stages or degrees, each of which is illustrated by some characteristic mineral as a standard of comparison. These, commencing with the softest, are:—1, Talc; 2, Rock salt; 3, Calc spar; 4, Fluor spar; 5, Apatite; 6, Felspar; 7, Quartz; 8, Topaz; 9, Corundum, or emery; and 10, Diamond. The diamond is the hardest known mineral. The degree of hardness of minerals does not necessarily govern their *toughness*; some, such as flint, although very hard, are brittle, and break with a peculiar fracture.

The forms assumed by minerals are described by various terms—when geometrical forms are developed the minerals are said to be *crystallised*; when they are without any definite form they are called *amorphous*; when lens-shaped, *lenticular*; needle-like, *acicular*; star-like, *stellate*, and so on. The definite geometrical forms which mineral substances assume under favourable circumstances are known as *crystals*; and minerals are said to crystallise in the following six different systems, according to the particular form, or forms, they take on—1. Cubic, or Octahedral; 2. Tetragonal, or Pyramidal; 3. Rhombic, or Prismatic; 4. Hexagonal, or Rhombohedral; 5. Monoclinic, or Oblique; and, 6. Triclinic, or Anorthic.

Many minerals have a tendency to split along certain definite planes, termed *planes of cleavage*. These latter bear a constant relation to a certain face, or to certain faces of the form in which the mineral crystallises. The majority of minerals are capable of being cleaved in several directions, but there is generally one direction which splits with greater facility than the others.

The specific gravity of minerals is also very variable, ranging from 1 to 19, according to the particular kind. Some possess distinctive odours; others are characterised by their taste, touch, flexibility, elasticity, magnetic properties, colour, lustre, degree of transparency, or peculiar optical phenomena.

The student will readily perceive that the mineralogist has a variety of means at his disposal wherewith to determine a given mineral, and very rarely indeed does a common rock-former present much difficulty to him. Even if it is very minute, the microscope is brought in, whilst in other cases he tests its fusibility and appearance under the flame of the blow-pipe, and he may be able to make a chemical analysis of the substance. At the same time it may be next to impossible to accurately determine the species of a mineral substance which has undergone much decomposition, though even then he could often surmise its former character from concomitant circumstances. Slight difficulties are sometimes presented by *pseudomorphs*—minerals having a form characteristic, not of their own, but of some other substance. These have mostly been fashioned in the following manner:—A mineral crystallising, say, in the monoclinic system, has decayed, and its substance having in the ordinary course of nature been removed from the stone, a cavity resulted and a cast of its form was left in the matrix in which it was embedded. Subsequently, mineral matter in solution penetrated the stone and filled up the cavity, and the infiltrating mineral has assumed the outward form of a monoclinic mineral, whether it really crystallised in that system or not. Thus, by taking a cast of the mineral which originally occupied the cavity, a hexagonal form might be made to assume a monoclinic aspect outwardly.

The term *rock* is applied to any mass of mineral matter consisting of one or more simple minerals. In ordinary language a "rock" is generally understood to mean a hard substance, but the geologist employs the term to designate mineral masses of all kinds, whether hard or soft. To him, clays and sands are rocks, quite as much as are granites and marbles.

There are many different kinds of rocks, composed of a variety of minerals, but a very superficial examination shows that some of these latter occur much more frequently than the others. We cannot devote space to the consideration of all the minerals found abundantly in rocks, though we shall attempt to describe the more important of them that enter into materials of construction, and other substances with which the architect has to deal. Foremost amongst these are two of the Silica group—quartz and flint.

Quartz crystallises in the hexagonal system, its common form being hexagonal prisms terminated by hexagonal pyramids; has practically no cleavage; is colourless when pure, and usually transparent, like glass; fracture, conchoidal; lustre, vitreous; hardness, 7; specific gravity, 2·5—2·8; chemical composition, silicon = 46·67, oxygen = 53·33 per cent. Quartz enters very largely into the composition of many igneous, aqueous and metamorphic rocks, but the crystalline boundary lines of the mineral are not often clearly shown, especially in the thoroughly crystalline varieties where the minerals have not had an opportunity of crystallising out freely. Probably, the most perfect quartz crystals are found lining cavities in rocks. Fragments of the mineral, derived from the destruction of the crystalline rocks, form the bulk of many aqueous. The student will readily distinguish quartz, in building stones, from its white, transparent, or smoky appearance, and by its hardness; it cannot be scratched by a steel penknife.

Flint is another variety of silica, differing from quartz in that it does not assume any crystalline form, is not so pure, and presents a dull leaden or black colour. It occurs as nodules and tabular masses in aqueous rocks, particularly in the upper portion of the Chalk formation, and is much used in the east and south-east of England for building purposes and road-metal. As minute particles, it frequently contributes to the substance of certain fragmental rocks.

The minerals of the Felspar group next claim our attention. They are essentially silicates, containing alumina, together with potash, soda and lime, following the various kinds. Iron is occasionally present. Of the numerous species composing the group, we need only mention orthoclase and oligoclase.

Orthoclase felspar crystallises in the monoclinic system; cleavage planes usually very apparent; colour, variable, but mostly white, pink, or red in building stones, semi-transparent, or opaque; chemical composition, silicate of alumina and potash, often with small proportions of soda, magnesia, lime, iron, or manganese; hardness, 6; specific gravity, 2·39—2·62. It occurs as a common constituent of many plutonic and of certain metamorphic rocks.

Oligoclase felspar crystallises in the triclinic system; cleavage, perfect; colour, grey, light green, white, or yellow; chemical composition, silicate of alumina and soda, sometimes also small proportions of potash, lime, iron, and manganese; hardness, 6; specific gravity, 2·58—2·7. The felspars crystallising in the triclinic system are known generically as *plagioclase*. The variety now under discussion frequently occurs in igneous rocks, both plutonic and volcanic, as well as is some of the metamorphic.

Neither orthoclase nor oligoclase occurs in aqueous rocks except as fragments derived from the igneous and metamorphic. In the latter they are frequently found in company with quartz, and the student will have no difficulty in recognising the larger crystals of orthoclase by comparison. Its milky-white or opaque-red appearance, together with the circumstance that it can be scratched with the point of the knife, readily distinguishes it from the transparent-white, or smoky and harder mineral, quartz. The minuter crystals of orthoclase, and oligoclase generally, are more difficult to determine, and the microscope is requisitioned therefor. It is useful to be able to distinguish the difference between these two felspars, because in building stones, oligoclase usually weathers more rapidly than orthoclase.

The decomposition of felspars has provided two rocks of great importance commercially, viz., kaolin, or china-clay, and clay such as is used for brickmaking, though the latter rock has been modified by the addition of other mineral matter.

ARCHITECTURAL ASSOCIATION ANNUAL EXCURSION.—Among the places to be visited on the annual excursion of the Architectural Association (which starts on August 14) will be, as far as the programme is decided, South Lopham, Quidenham Park, Wilby, New Buckentram, Scole, Redenhall, Thelveton, Ipswich, Helmington, Brome church and hall, Wingfield castle and church, Pulham (churches of St. Mary the Virgin and St. Mary Magdalene), Framlingham, Earls Soham, and Flemming's Hall. The consent of all the owners of places has not yet, we believe, been obtained, but that we hope may be considered a matter of form only.

GENERAL BUILDING NEWS.

ST. PETER'S CHURCH, STAINES.—The foundation-stone of St. Peter's Church, Staines, illustrations of which appeared in the *Builder* on June 24 last, was laid by Lady Clarke on Saturday afternoon last. The church is the gift of Sir Edward Clarke, Q.C., M.P., and the work is being carried out by Messrs. Goddard & Sons, of Farnham, from the designs and under the superintendence of Mr. Geo. H. Fellowes Prynne, the architect.

EXTENSION OF BROMSGROVE SCHOOL, NEAR BIRMINGHAM.—Lyttelton House, in connexion with the extension of Bromsgrove School, was opened by Viscount Cobham on the 12th inst. The new premises adjoin the old buildings, forming with the latter three sides of a quadrangle. The elevations are in red brickwork, with grey local stone dressings, the latter being freely used in the windows, string-courses, and copings of the parapets and gables. The roofs are covered with Broseley tiles. The east wing contains on the ground floor a library and two large sitting-rooms for the use of the junior boys, while over them are three dormitories. On the north side of the quadrangle are eight studies, a drying-room, lavatory, bath-room, and matron's rooms. Mr. Lewis Shepphard, of Worcester, was the architect, and the works have been carried out under his supervision by Mr. Jonathan Brazier, builder, Bromsgrove.

PARISH HALL, RYTON, DURHAM.—On the 12th inst. the Bishop of Durham laid a memorial stone of the new parish hall which is being built at Ryton. On the ground floor of the building there is to be a hall, 65 ft. by 30 ft. On the basement, accommodation will be made for class-rooms, kitchen, conveniences, and heating chamber. The material used is stone, from Messrs. Lishman's (the contractors for the work), quarry at Blaydon. The timber, plumbing, and glazing are by Mr. Tweedy, of Ryton. The architect is Mr. Crawford Hicks, of Newcastle. The total cost of the new hall, exclusive of furniture, will be 1,300*l.*

WESLEYAN CHAPEL, MORLEY, YORKSHIRE.—On the 15th inst. the memorial-stones of a new Wesleyan chapel and Sunday-school at Bank's-hill, Morley, were laid. The chapel will be in the Classical style, and the work of erection will be carried out under the supervision of Mr. T. A. Buttery, of Morley, the architect. There is a schoolroom on the basement, around which there are seven class-rooms. Above this is the chapel, which will provide accommodation for 609 adults. The total cost will be about 3,200*l.*

PROPOSED NEW CHURCH, MORLEY, YORKSHIRE.—The present church at Morley, which has been built some twelve years, being found to be much too small for this quickly-increasing town, it has been decided to build a new church, using up as far as possible the material of the old building. Designs have been prepared by Mr. Geo. H. Fellowes Prynne, of Westminster, and the contract for the nave and transepts has been undertaken by Messrs. Sugden Bros., contractors, of Morley. The total cost of the church, with chancel, vestry, and baptistry complete, will be about 8,800*l.*

RESTORATION OF KINGSTON CHURCH, DEVONSHIRE.—On the 13th inst. Kingston Church, near Bigbury Bay, Devonshire, was re-opened after restoration. Twelve months ago, says the *Western Morning News*, the church was in a deplorable state of decay, and in danger of collapsing. All the timber work was rotten, the north wall was 18 in. out of the perpendicular, and the barrel roofs, when stripped of the plaster, crumbled to pieces with decay. Plans for the restoration of the edifice were prepared by Mr. Edmund Sedding, architect, of Plymouth, and have been carried out by Mr. J. Lukecraft, of Aveton Gifford, and Mr. W. Triggs, of Kingston. The north wall has been entirely rebuilt, and an unsightly modern vestry attached to it removed. The arcade has been made upright, the plaster removed, and the walls pointed. New roofs have been constructed, with curved ribs of oak in the nave and chestnut in the north aisle. By the removal of the vestry a three-light window has been opened out, and a new three-light traceried window of granite has been inserted in the east end of the north aisle. All the other windows have been repaired and filled with cathedral glass. The building has been re-floored, and chairs substituted for the high pews. In the chancel a pavement of coloured tiles has been laid, with steps of granite. The total cost of the work has been about 1,000*l.* During the restoration interesting fragments of the original building were revealed, and great care has been taken as far as possible to preserve them intact. Buried in the west wall of the tower was discovered a Decorated window of the fourteenth century. Several jambs found in the two westernmost windows of the south wall are of thirteenth-century date, and are the earliest features in the church. Fragments of the old churchyard cross were found buried in one of the walls, and these will be carefully restored.

BRITISH SCHOOLS, WORCESTER.—The memorial-stone of new British schools in St. Martin's-gate, Worcester, has just been laid by Miss Binyon. The schools are being erected on a site adjoining the boys' present school, and are for girls and infants. The infants' school, on the ground floor, will be 69 ft. long and 20 ft. wide, with babies' room and class-room. The girls' school, on the first floor, will be 50 ft. long and 20 ft. wide. Three class-rooms, providing accommodation for 248 infants and 226 girls, are to be erected. There are to be separate entrances from Bowling-green-terrace for the girls and infants, and cloak-rooms and lavatories for each. There is to be a separate staircase from the girls' school and class-rooms. The schools will be heated by hot water. The materials to be used are red bricks for walls, with moulded brick strings, &c., and roofs covered with tiles. The floor of the infants' school and class-rooms will be laid with wood blocks, and the girls' schools and the class-rooms boarded. Messrs. Bromage & Evans are the builders, and Messrs. Yeates & Jones, of Worcester, are the architects.

CHANCEL, ST. THOMAS'S CHURCH, SEAFORTH.—On the 11th inst. the Bishop of Liverpool laid the memorial stone of the new chancel to St. Thomas's Church, Seaforth. The principal dimensions inside the walls will be 36 ft. 6 in. in length, by 23 ft. 6 in. in width. On the north side there will be a new organ chamber, immediately adjacent to the present choir vestry. There will be accommodation in the new chancel for a choir of thirty men and boys, the clergy having separate stalls. The choir stalls will be of oak. The chancel floor will be raised 2 ft. above the floor of the nave, and will be laid with wood block flooring. The floor of the sacrarium will be laid with glass mosaic. On the south side of the sacrarium there will be a sedilia for three clergy and credence table; on the north side, the bishop's chair, and priest's door leading into the clergy vestry. The chancel wall will be of red stone, with wrought-iron grille on top. It is proposed to move the pulpit from its present position to the north side of the chancel. There will be additional accommodation in the nave and old organ chamber for eighty. A porch will be built for the choir vestry. The materials used are grey brick for the exterior, with terra-cotta tracery to the windows, sedilia, chancel, and organ arch, also all doorways. There will be a three-light window over the altar, and windows north and south of the chancel. The contractor for the work is Mr. Isaac Dilworth, of Wavertree, the architect being Mr. Charles Aldridge, of Liverpool.

PROPOSED EXTENSION OF EDINBURGH FEVER HOSPITAL.—On the 4th inst., at a meeting of the Public Health Committee of the Edinburgh Town Council, a report was submitted by the Fever Hospital sub-committee recommending general approval of a block plan of the proposed additions and alterations on the City Fever Hospital prepared by the City Superintendent of Works. The probable cost is set down at 50,000*l.* The Committee resolved to recommend general approval of the plans to the Magistrates and Council, and to crave a remit, if the plans are approved, to prepare plans and specifications, and to obtain estimates for the work. If necessary the additions can be carried out by degrees, so that the whole expenditure does not necessarily require to be sanctioned at once. The formation of the ground, it seems, is responsible for the heavy cost, the slope to the Cowgate necessitating the construction of retaining walls. The plan shows a series of detached pavilions or isolated wards, the intention of the architect being to have the different diseases kept apart and practically in separate buildings.—*Scotsman.*

TECHNICAL SCHOOLS, MAIDSTONE.—On the 6th inst. the Mayor of Maidstone laid the foundation stone of the new Technical Schools of Science and Art. The building will form the west and north-west wing of the present Museum buildings. In the basement are engine-room and workshop for electric lighting and experiments, heating apparatus, and storage. On the ground floor are entrance hall, library, physical science lecture room, lecturer's preparation room, and students' laboratory, wood-carving shop, chemical laboratory, balance room, and lecturer's preparation room, large lecture room, science class rooms, master's room, and store for apparatus. On the first floor there are landing and upper hall (forming picture gallery), committee room, art master's room, elementary art class room, life studio and dressing room, painting room, antique studio, modelling room and cast store. All the studios have north or north-east light. The entrance hall is in communication with the Museum. The building is designed as part of a plan for the extension and completion of the Museum on the lower side by building a new curator's house at the extreme west end, fronting St. Faith-street, and erecting an extension of the art wing of the Museum on the site of the present house. This will form a second fore-court, of which the school entrance will form the north, and the curator's house and new museum wing the west and east flanks respectively. The designs have been prepared by Mr. Albert W. Smith, F.R.I.B.A., of the firm of Messrs. Ruck & Smith, Maidstone. The contract for the building has been taken at the sum of 6,867*l.* by Messrs. Wallis & Sons, and that for the plumbing by Mr. H. Brennan, at 848*l.*

ENLARGEMENT OF SCHOOLS, ILLINGWORTH, YORKSHIRE.—On the 15th inst., the memorial stone was laid in connexion with the enlargement of St. Mary's Church Sunday Schools, at Illingworth. In the basement there is to be the caretaker's house and kitchen, together with two large class-rooms. Ascending to the room above, which is on a level with the ground floor of the present school, there is to be an assembly-room, and the present building will be divided into four class-rooms. The whole work will entail a cost of about 1,500*l.* Messrs. Horsfall & Wiiliams, of Halifax, are the architects, and the tenders of the following Halifax firms have been accepted for the carrying out of the work, viz.:—Mr. Edwin Naylor, mason; Mr. Joseph Halliday, joiner; Messrs. Blackburn & Davenport, plasterers; Messrs. Murgatroyd Bros., painters; plumber, Mr. Boocock.

PROPOSED CHURCH WORK, LIVERPOOL.—Chancellor Espin, D.D., held a consistory court for the diocese of Liverpool in the vestry of St. Nicholas's Parish Church, on the 18th inst., when faculties were granted as follow:—For the erection in the chancel of St. Nicholas's, Blundellsands, of a reredos of oak, with carved figures representing in the centre "Christ as the Good Shepherd," and in the side panels, Christ's love and power shown in His blessing little children and raising the dead. The cost of the reredos, between 300*l.* and 400*l.*, will be defrayed by Sir William B. Forwood.—The Rev. R. F. Herring, vicar of St. John the Baptist, Toxteth, made application to remove the present altar, and to substitute a new one of carved oak; and also to form a side chapel by opening an entrance to the south vestry through the wall of the south transept. The new altar for the church is being prepared according to a design of Messrs. Woolfall & Eccles, architects, of Liverpool.

CONGREGATIONAL CHURCH, STROUD GREEN.—On the 13th inst. the foundation-stone of the Mount View-road Congregational Church, Stroud Green, was laid. The estimated expenditure on the new church will be about 9,000*l.* The new church will be built of red brick, faced with terra-cotta, and will have a tiled roof. The underground hall, parlour, and class-rooms, which the slope of the land rendered advisable, will not be furnished for a time after the church is completed. The building is designed to seat 1,000 on the ground floor and in the galleries, which will run round three sides of the church. The architects are Messrs. Beaumont, of Watling-street, and Mr. W. Shepherd, of Bermondsey, is the builder.

NEW Y.M.C.A. BUILDINGS, PAIGNTON.—On the 19th inst. the foundation-stone of new buildings for the Paignton Young Men's Christian Association was laid by Mr. O. S. Bartlett, Chairman of the Local Board. The plan of the building comprises a reading-room 28 ft. by 27 ft., games'-room 22 ft. by 14 ft., committee-room, music-room, class-room, and a gymnasium 40 ft. by 20 ft. There will be three stories, and the ground floor will be occupied as shops. The cost of the building is estimated at 1,690*l.* Mr. W. G. Couldrey, of Paignton, is the architect, and Messrs. C. and R. E. Drew are the builders.

MISSION CHURCH, LONG HANDBOROUGH, OXFORD.—On the 15th inst. the Duke of Marlborough laid the foundation-stone of a mission church at Long Handborough. The building will have accommodation for about 200 persons. It will be 46 ft. in length, and 22 ft. wide, with a chancel 21 ft. by 15 ft., and there will be a vestry which it is intended to use for classes. Local stone, rock-faced, will be used, with Bath-stone dressings for the windows, &c., and the roof will be of open timber and slated; at the west-end there will be an open oak-framed porch with a bell turret, and the building throughout will be warmed with Porritt's hot-air apparatus. The architect is Mr. E. H. Lingen Barker, of London, and the builders are Messrs. Giles & Son, of Kenilworth.

COTTAGE HOSPITAL, WILLESDEN.—On the 18th inst. a new cottage hospital was opened in Harlesden-lane, Willesden. The building has been erected from designs by Messrs. Newman & Newman, architects, of London.

BLACKPOOL TOWER.—Messrs. Maxwell & Tuke, architects of the Blackpool Tower, report that the building is now practically completed up to the level at which the lifts land. The whole of the work is made to the very top, and has been erected in Messrs. Heenan & Froude's yard at Newton Heath. Plans at the present time are before the Building Plans Committee of the Town Council for the erection of a large restaurant capable of seating 700 people at once, and for a large new assembly hall with two heights of galleries and stage for entertainments and orchestra.

TOWN HALL, KENDAL, WESTMORELAND.—On the 6th inst. the foundation-stone of the new Town Hall, Kendal, was laid by Mrs. Bindloss. The architect of the building is Mr. S. Shaw, of Kendal.

WESLEYAN CHAPEL, SPOTLAND, LANCASHIRE.—On the 15th inst. the corner-stones of a new Wesleyan school-chapel in Silver-street, off Spotland-road, were laid. The new chapel, which is to accommodate 250 persons, will be supplied with class-rooms, and is estimated to cost about 800*l.* Mr. Edgar Wood, of Middleton, is the architect, and Mr. Kay the contractor.

EXTENSION OF THE CITY OF LONDON COURT.—The foundation-stone of the extension to the City of London Court was laid on the 17th inst. by Mr. J. Tickle, Chairman of the Law and City Courts Committee. According to the *City Press*, the superficial area of ground to be covered by the new structure is about 1,420 ft., having a frontage to Basinghall-street of 28 ft. There will be four floors,

including a basement, and each floor will be at the same level as the corresponding floor of the present building. The accommodation on the ground-floor will be thrown into the office at present used by the clerks in the Registrar's department. It will not be necessary to do any pulling down to form the connexion between the new and the old building, as arched openings already exist, and only require to be opened out. The first floor, which is on the same level as the Courts, is to accommodate the Registrar, while the counsel and solicitors who practise at the Courts are to have rooms set apart for their own use. Accommodation is to be made for a resident housekeeper on the second floor of the additional premises, the basement being used for the storage of records and books. The style of the new work will match the existing building, which is early fifteenth-century Gothic. The windows to the ground and first floors next Basinghall-street will have cusped heads. The floors throughout will be made fire-resisting with coke-breeze concrete carried on rolled-iron joists. The contract is in the hands of Messrs. E. Lawrance & Sons, builders, and the estimated cost is 5,280*l.* The architect is Mr. A. Murray, A.R.I.B.A., the City Surveyor, who also designed and superintended the erection of the present Court-house.

PUBLIC BATHS, EDINBURGH.—At a meeting of the Plans and Works Committee of the Edinburgh Town Council, on the 20th inst., the estimates for the new public baths at Dalry were accepted, the amount being 8,900*l.* The plans are by Mr. Morham, City Architect.

EXTENSION OF NEWPORT INFIRMARY—According to the *Western Mail*, the new wing added to the Newport Infirmary is nearly completed. The new wing has been built by Mr. Edwin Richards, from plans by Messrs. Habershon & Fawckner. It will be known as the Port Ward, and will provide accommodation for the nurses and for patients, bringing the total number of beds in the institution up to sixty-seven.

WESLEYAN SUNDAY SCHOOL, NORTH SHIELDS.—On the 12th inst. the memorial stones were laid of a new Wesleyan Methodist Sunday School in North Shields. The main building, which is to be utilised as a Sunday school or lecture hall, will be 51 ft. long by 30 ft., having transepts at the northern end separated from it by revolving shutters which will be used as class rooms; these are 17 ft. wide by 16 ft. deep. In like manner the infant school, to the north of the hall (24 ft. long by 19 ft. wide) is separated by revolving shutters. The accommodation thus afforded is 200 children in classes in the hall, forty in each of the class rooms, and eighty in the infant school. There are two entrances to the hall. An additional room is obtained over the infant school, and accommodates eighty persons. Access to this is obtained by a staircase at the side of the infant school, which also gives access to the yard on the ground floor, in which are placed the requisite outbuildings. In the north-east corner of the site, but attached to the school buildings, is a house for the church officer. In the basement of the school is placed the heating cell. The hall presents a gable to the south, with two three-light trefoiled headed windows in the lower part, separated by a buttress, with ornamental weatherings, and a large circular window above, filled with tracery. The connecting corridor to the church porch has a pointed double moulded arched entrance. The other elevation (east) presents a double gable to Drummond-terrace, with moulded arched headed doorway on ground floor; in the higher one the side walls and class room gable contain numerous windows. Internally the lecture hall has an open collar beam roof with wrought iron principals. It is 13 ft. 6 in. high at the side walls, and 21 ft. in the centre part. The platform at the north end is constructed so as to give a gallery over it, supported on wood posts with open rails. The whole of the buildings have been contracted for by Mr. T. W. Wier, of Howdon-on-Tyne. The design for the buildings has been furnished, and the work is being carried out under the superintendence of the architect for the church (Mr. F. R. N. Haswell. F.R.I.B.A., of North Shields).

SANITARY AND ENGINEERING NEWS.

NEW WATERWORKS, DENBY, YORKSHIRE.—The new waterworks at Denby, Yorkshire, have just been completed. The reservoir has a capacity of two million gallons, and is 738 ft. above sea-level. A service reservoir with a capacity of 100,000 gals. has been made at Rusby plantation, 993 ft. above sea-level. About five years ago the Local Board made a small service reservoir at Moist Holme, previous to which the whole township was supplied by water from pumps and wells. The population provided for in the supply is 1,750, and the total cost of the scheme is about 5,500*l.* The works have been constructed by Messrs. Abbott Brothers, Denby Dale, under the supervision and upon plans prepared by Messrs. G. & G. H. Crowther, engineers, Huddersfield.

NEW VIADUCT AT BONARBRIDGE, N.B.—On the 7th inst. the new viaduct over the Kyle of Sutherland, at Bonarbridge, was opened by Lady Ross of Balnagown. The old Bonar Bridge, which was erected by Telford in 1811-12 over the Kyle of Sutherland, at the head of the Dornoch Firth, was carried away by a flood on January 29 of last year. The old bridge was very narrow, having a width of only 15 ft., and with very steep gradients rising to the centre of the largest span. It consisted of two masonry arches of 50 ft. and 60 ft. span respectively, and one cast-iron arch of 150 ft. span and 20 ft. rise. The tender of Sir William Arrol & Co., Limited, Dalmarnock Ironworks, Glasgow, was accepted for the new bridge, the amount being 12,584*l.* 17s. The new bridge has three spans of 70 ft., 105 ft., and 140 ft. respectively, with a clear width of roadway of 25 ft., and an even gradient across the bridge of 1 in 50 in place of the steep inclines on the old structure, and a total width of available waterway of 315 ft., as against 260 ft. in Telford's bridge. The west or Ross-shire abutment is carried down to a bed of hard gravel, and the masonry commenced on a thick bed of concrete, while at the east or Sutherlandshire abutment the masonry rests on the solid rock. The masonry facework is of Rogart granite, while the quoins are of red granite from Corrennie Quarry in Aberdeenshire. The masonry part of the contract, being chiefly granite, was sub-let to Mr. John Fyfe, of Aberdeen. The piers are founded on cylindrical steel caissons, sunk by the pneumatic process to a bed of hard gravel in the case of pier No. 1, and to the solid rock in the case of pier No. 2. The superstructure consists of bowstring girders, with overhead bracing at the 140-ft. span, and numerous side stiffeners on all the girders; and the flooring is of troughs built up with Z bars and plates, rivetted to the top flanges of the cross girders and joined with curved plating. This flooring is covered with concrete, and on the roadway proper this is laid with granite cubes bedded on sand, while the footpath is formed with Caithness pavement. A parapet of steel lattice work runs the whole length of the bridge on the inner side of the main girders, and ornamental scrolls fill in the angles between the sides of the pilasters and the curved upper boom of the main girders. Messrs. Crouch & Hogg, of Glasgow, were the engineers of the bridge.

PROPOSED NEW TYNE BRIDGE.—It is proposed to erect a new bridge across the Tyne, from the foot of Pilgrim-street, Newcastle, to Church-street, Gateshead. In a report prepared by Messrs. Sandeman & Moncrieff, engineers, of Newcastle, it is stated that, with regard to the position of the bridge, the most favourable site is that shown on the plan prepared by the late Mr. Hubert Laws. The most suitable and economical type of bridge would be that of a cantilever bridge. The bridge would comprise a central river span of 500 ft. between centres of piers, approached by two spans of 150 ft. each on the Newcastle side, and by one span of 85 ft. across Church-street on the Gateshead side. The proposed bridge would have a central main roadway of 30 ft. width, suitable for a double line of tramways, and room to pass for vehicles, and two footpaths, 10 ft. wide, on each side of the main roadway. The estimated cost of the construction of the bridge, exclusive of cost of land and buildings, is about 125,954*l.*

PROPOSED SEWAGE WORKS, RAMSBOTTOM, LANCASHIRE.—On the 18th inst. Colonel Ducat, R.E., attended at the Local Board offices, Ramsbottom, to hold an inquiry into the Board's application to the Local Government Board for sanction to borrow 30,000*l.* for the purposes of sewage within the Board's district. Mr. Nuttall, engineer to the scheme, gave particulars of the proposed treatment of the sewage. At the close of the inquiry the Inspector, accompanied by members and officials of the Board, drove to the site of the proposed sewage works at Summerseat.

WATER SUPPLY, WOTTON-UNDER-EDGE.—The Dursley Sanitary Authority (who were supported by the recommendation of the Parochial Committee and of a largely-attended meeting of ratepayers) having applied to the Local Government Board for permission to borrow the sum of 3,000*l.* to carry out a scheme for supplying the town with water, Mr. Thomas Codrington recently held an inquiry in relation thereto at the Town Hall. Mr. Wenden, Clerk to the Authority, read the notice convening the meeting. Mr. Peters, agent to Lord Fitzhardinge, stated that the conditions under which his lordship gave the water were that sufficient should be left for the land, and that it should be confined to the area laid down in the present plan. Mr. Peters having pointed out to the Commissioner the lands owned by Lord Fitzhardinge, Mr. A. P. I. Cotterell, A.-M.Inst.C.E., of Bristol, engineer to the scheme, explained the details of the plan, and answered a number of questions put by the Commissioner as to the levels, and more particularly as to the gauges laid down and the yield. The lowest reading was 28 gals. per minute, or over 40,000 gals. per day, from the sixteen springs at Hamlin Brake, exclusive of the springs at what is known as Weetfield. Dr. Joynes answered a number of questions as to the lack of water in the upper part of the town. Afterwards Mr. Chanter moved a vote of thanks to the Commissioner for the courteous way in which he had carried out the inquiry. The Commissioner, Mr. Cotterell, Mr. Wenden, Mr. Henley, and others, afterwards visited Hamlin Brake, and it was generally understood that the scheme, subject to some amendment, would be accepted by the Local Government Board.

EXTENSION OF HARBOUR, DOVER.—On the 20th inst. the Prince of Wales laid the memorial stone of the works in connexion with the extension of Dover Harbour. The works designed for the formation of the Outer Harbour consist of an extension of the Admiralty Pier, 580 ft. in length, to form the western arm, and of an entirely new work—the East Pier (the first stone of which was laid by the Prince), intended to give shelter from the east and south-east. The memorial stone will form part of the approach to the East Pier. From a point directly seaward of the stone an iron viaduct, 1,260*l.* ft. long, will be constructed, the deck-level being 19 ft. above high water. The remaining portion of the pier will be of solid masonry and 1,500 ft. in length, curving towards the south-west. The entrance between the head of the East Pier and the end of the Admiralty Pier, when extended, will be 450 ft. in width. When completed the sheltered area of the new harbour will be 56 acres, one half having a depth of three to six fathoms at low water. The works include the reclamation of a considerable portion of land on which two railway jetties will be constructed, and alongside which four steamers can be berthed. Messrs. Coode, Son, & Matthews are the engineers for the new East Pier, the contractor being Mr. John Jackson, whose contract is for 419,000*l.* The extension of the Admiralty Pier and the railway jetties will not be undertaken at present.

FAILSWORTH SEWAGE SCHEME.—An inquiry was held by Colonel M. Ducat, R.E., Local Government Board Inspector, on the 19th inst., at the offices of he Failsworth Local Board, into an application to borrow 27,000*l.* for sewers and sewage disposal works. The chairman of the Local Board, and most of the members were present, together with the Board's Solicitor, Clerk, and Surveyor. Mr. C. I. Lomax, Surveyor and Engineer, explained the scheme, which he said was based upon experience gained in dealing with the sewage of other townships. They had obtained a site for the purposes of works for sewage disposal, and the scheme was one that might be considered of a permanent character. It was proposed to lay tributary and main concentrating sewers to collect the whole of the sewage and carry it to one outfall, where, after being precipitated in tanks, it would be passed through polarite filters. There was practically no opposition, and the inquiry terminated, the inspector subsequently visiting the proposed site.

WATER SUPPLY OF DUNKERQUE.—According to a recent report of the British Consul at Dunkerque, the new water supply of that town is brought in iron pipes from springs at Houlle, in the Pas de Calais, a distance of about 25 miles. The water is good, and there is a considerable number of taps in the town from which water may be taken gratuitously. The price to consumers supplied in their own houses by meter varies from 4⅜d. to ·586d. per cube yard, according to quantity taken, up to 38,169 cube yards. For all water over that quantity the price is ·586d. per cubic yard. The minimum charge is 1*l.* 4s. a year for 38,169 cube yards.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, PEEBLES PARISH CHURCH.—A stained glass memorial window has been placed in Manor Parish Church, Peebles, dedicated by Archibald Hewat, Edinburgh, to the memory of his mother and to his grandfather. The subject chosen for illustration is that of the visit of Mary Magdalene and Mary the Mother of James to the tomb of Christ on Easter morning. The window is from the studios of Messrs. A. Ballantine & Gardiner, Edinburgh.

RE-DECORATION OF THE PARAGON MUSIC HALL.—The Paragon Theatre of Varieties, Mile-End, is being redecorated throughout by Messrs. Campbell Smith & Co., of Newman-street, Oxford-street. The electric lighting arrangements and the preparations for heating the theatre will be carried out by Messrs. Vaughan & Brown. The architect is Mr. Frank Matcham.

MEMORIAL WINDOW, ST. SAVIOUR'S CHURCH, HERNE HILL, LONDON.—To perpetuate the memory of their late vicar, the Rev. L. T. Chavasse, M.A., the worshippers at St. Saviour's Church, Herne Hill-road, Camberwell, subscribed for a stained-glass window, which was recently unveiled by Mr. Alfred Lafone. The subject of the window is from the Parable of the Ten Talents, bearing the words, "Well done, good and faithful servant." The window was designed and executed by Messrs. A. L. Moore, of Southampton-row, W.C.

FOREIGN AND COLONIAL.

FRANCE.—M. Terrier, the Minister of Commerce, officially opened last Saturday the "Exposition Internationale de Progrés" at the Palace de l'Industrie.——M. Chédanne, the architect whose explorations at the Pantheon have attracted so much attention, has received the decoration of the Legion of Honour.——The Municipal Administration of Paris has given its confirmation to a project by M. Humblot for bringing the waters of the rivers Loing and Lunain to Paris. The addition of these new sources, which will necessitate an outlay of twenty-nine million francs, will provide for an increase of 60,000 cubic mètres a day in the Paris water supply.——The Government has pronounced the declaration of "Utilité Publique" in favour of a scheme for forming a new basin in the port of Marseilles, to the north

of the "bassin national," at an estimated expense of twenty million francs.——The jury of the competition opened at Conflans-Saint-Honorine (Seine-et-Oise) for a new Hôtel de Ville and a group of schools, has awarded the first premium to M. Theophile Bourgeois, architect, of Poissy; the second to MM. Girod and Hennequin, of Paris; and the third to M. Flamant, of Paris.——The new maritime canal at Nantes was opened on Sunday last. —— In the railway station at Nimes there is to be put up a bust of M. Paulin Talabot, the founder and director of the Paris, Lyons, and Mediterranean railway system.——The "Société des Architectes de l'Aisne" has organised a committee for the erection, at Ribemont, of a monument to François Blondel, Seigneur de Gallardon, the celebrated French architect, who was born at Ribemont in 1617 and died at Paris in 1686.——The death is announced, at Fourchambault, of M. Alfred Saglio, mining engineer, and director of the foundry at Fourchambault. He was the brother of M. Saglio the new curator of the Cluny Museum.——The death is also announced of M. Fonfaye de la Prandie, architect, former pupil of MM. Paccard and André. In his latter years he had devoted himself to engraving under the direction of M. Charles Courtry, and gained in this department an honourable mention in the Salon of 1889.——The Municipal Administration of Paris recently opened a competition between a certain number of painters for the decoration of the new Salle des Fêtes in the Mairie of the XIIth arrondissement. This limited competition not having given satisfactory results, a new one is to be opened shortly.——The Municipality of Paris has authorised the "Société Nationale du Souvenir Français" to erect on the Place Vauban, behind the École Militaire, a monument to the memory of soldiers and sailors who have died in the service of France. The design for the monument is to be submitted to the approval of the Municipal authorities.

MISCELLANEOUS.

REREDOS, ST. ANDREW'S CHURCH, EAST ALLINGTON, DEVONSHIRE.—In addition to the western window, Mrs. Cubitt, widow of the late William Cubitt, of Fallapit, has just erected a reredos in the sanctuary of St. Andrew's parish church, East Allington, together with altar and altar rails. The present works were designed by Mr. E. L. Parsons, the architect, and carried out in the studios of Messrs. Harry Hems & Sons, of Exeter. The reredos proper occupies the whole width of the fifteenth-century window above, and its fabric is carried out entirely in veined and polished alabaster. Wings of the same material, consisting of a double arcading, one above the other, extend from it to the north and south walls. This work is also returned on each side, continuing westward as far as the new carved oak altar rails, where it again returns north and south. It is all of Perpendicular Gothic character. Above the super-altar is a large recessed and canopied panel, in which a representation of the Crucifixion is carved in high relief. Divided by ornamental buttresses, which terminate amidst foliage above in crocketted pinnacles, are four groined and canopied niches, two on each side. In these are statues of SS. Matthew, Mark, and Luke, as well as of St. Andrew. All the sculpture is in pure white Castellini marble. On the north side a credence table has been placed, also in polished alabaster, with a foliated cross of Castellini marble let into its shelf. The altar rails are, like the new altar, of well-seasoned oak, and carved. They also are by Messrs. Harry Hems & Sons.

A MUCH-NEEDED IMPROVEMENT. — At the meeting of the Strand Board of Works on Thursday, Mr. George Cox, in moving the adoption of the Works Committee's report, stated that a letter had been received from Messrs. Clutton, applying on behalf of the Ecclesiastical Commissioners for leave to widen and improve Chichester Rents, Chancery-lane. He might mention that Chichester Rents is at present a narrow court with crooked frontages, and entered from Chancery-lane by an archway about 4-ft. wide and 30 ft. long. It is now proposed to throw the whole of the court open and to make it of a uniform width of 11 ft. with straight frontages. The Committee are of opinion that the alterations proposed will, if carried out, be a great improvement to Chichester Rents and an advantage to the public, and accordingly recommend that the Board's assent to the proposed improvement be given. He added that there were certain conditions precedent, and with these the Commissioners were prepared to comply, such as that the necessary paving works be carried out at the expense of the applicants. The report was adopted, and a general opinion expressed that a much-needed improvement in Chancery-lane would by this means be carried out by the Ecclesiastical Commissioners.

NEW CLOCK AT YORK.—Messrs. Makins & Sons, drapers and silk-mercers, Parliament-street, York, have placed a large illuminated clock on the front of their premises in that thoroughfare, which hitherto has been without a public clock. The work has been executed by Messrs. Wm. Potts & Sons, clock manufacturers, of Guildford-street and Cookridge-street, Leeds.

ROYAL ACADEMY ARCHITECTURAL SCHOOL.—The following students have been admitted: Upper School: Messrs. E. W. Marshall, H. Seton Morris, E. A. Pearce, and H. A. Saul. Lower School: Messrs. C. C. Brewer, A. R. Hennell, F. T. Howard Ford, P. Rodeck, J. E. Smales, W. E. Tower, and V. W. West.

BUST OF THE LATE MR. JOHN INSHAW.—Mr. John Roddis, sculptor, of Aston-road, Birmingham, has, we are informed, modelled a bust of the late Mr. John Inshaw, C.E., inventor of the twin-propeller, who died a few months ago, for the deceased gentleman's friends.

PARTNERSHIP. — We are informed that Mr. William Mallinson, timber and veneer merchant, 136 and 138, Hackney-road, N.E., has admitted into partnership Mr. James Richardson (his late manager), and that the business will be carried on as heretofore, except that the name of the firm will be William Mallinson & Co.

THE "DUPLEX" CRAMP.—This is an invention by Mr. W. C. Chappell, intended as an improvement upon the present methods adopted in wedging up light sashes, doors, &c., which by unduly forcing the joints on the inside, tend to open them on the outside. Each cramp consists of a pair of double "shoes" which grip the work on both sides of the rail simultaneously, the space between being sufficient to allow for any ordinary sized tenon to project, and for driving the wedges.

LIFTS.—Messrs. Waygood & Co., of London, have received instructions to construct and erect a passenger lift at Balmoral Castle for the use of Her Majesty.

MEETING OF MUNICIPAL ENGINEERS AND SURVEYORS.—Owing to want of space we are compelled to hold over the continuation of the account of this meeting.

SEATS AT HAMPTON COURT.—One of the drawbacks to enjoyment at Hampton Court is the meagre sitting accommodation provided in the grounds, the lack of seats being especially noticeable on a fine Sunday, when the park is filled. Mr. A. C. Morton is in communication with the First Commissioner of Works with the idea of a further provision of seats, and he has also evolved a proposal that a refreshment-stand should be erected within the grounds for the convenience of thirsty and hungry visitors. The reply of Mr. Shaw-Lefevre has not yet been received.—*Pall Mall Gazette.*

CAPITAL AND LABOUR.

THE LOCK-OUT IN THE BLACKBURN BUILDING TRADE. — A conference of the Master Builders' Association and the Blackburn Industrial Federation was held on the 21st inst. at the Devonshire Hotel, Blackburn, respecting the present lock-out in the building trade. The representatives of the men's Federation adhered to their original demands of ¼d. advance to the plasterers at once and another ¼d. in March next. The masters, however, contend that the present condition of trade will not warrant such an advance, and they decline to grant it. The masters also intimate that all conferences with a respect to a settlement were now at an end, unless the men wish to meet them as to the acceptance of their terms. It is reported, however, that the masters have decided to give work to non-union men, but to continue the lock-out against union men.

THE CARPENTERS' STRIKE IN SHEFFIELD.—Most of the masters in Sheffield have granted the demand of the carpenters and joiners for an increase of a halfpenny in their wages—from 8d. to 8½d.—and the strike is therefore practically at an end.

MEETINGS.

SATURDAY, JULY 29.

British Institute of Public Health. — Congress at Edinburgh (continued).

MONDAY, JULY 31.

Incorporated Association of Municipal and County Engineers.—Metropolitan District Meeting, to be held at Westminster.

British Archæological Association.—Opening of Fiftieth Annual Congress, Winchester.

British Institute of Public Health. — Congress at Edinburgh (concluded).

TUESDAY, AUGUST 1.

British Archæological Association.—Annual Congress, Winchester (continued).

WEDNESDAY, AUGUST 2.

British Archæological Association.—Annual Congress, Winchester (continued).

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8.30 p.m.

THURSDAY, AUGUST 3.

British Archæological Association.—Annual Congress, Winchester (continued).

FRIDAY, AUGUST 4.

British Archæological Association.—Annual Congress, Winchester (continued).

SATURDAY, AUGUST 5.

British Archæological Association.—Annual Congress, Winchester (continued).

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

14,868.—UTILISING WASTE WATER: *J. Day.* — An automatic tipping appliance for closets is the main object of this invention. When one pan is in position the other is filling; so soon as the first is full it discharges its contents, leaving the half-empty one to take its place, which, when filled, is also automatically tilted and emptied.

15,018. — SCAFFOLD AND LADDER: *E. Partridge.*—According to this invention a board is held up on a ladder by means of a chain with hooks, which, depending from the top of the ladder, is fastened near the end of the board to a rung or to the sides of the ladder.

15,165.—DISINFECTING APPARATUS: *W. A. Wood and another.*—This invention consists of an improved apparatus to be used in conjunction with flush cisterns. The disinfectant is contained in a small vessel and an air-tube and syphon, arranged so as to supply a small quantity of disinfectant at each flush.

5,588.—WINDOW-SASH FASTENINGS: *W. N. Cook.*—The fastening which is the subject of this patent is made by two bolts, which work transversely, and can be fixed at either or both sides of the sash.

5,707.—PORTABLE TERRA-COTTA STOVES: *T. Roberts.*—To prevent the falling in of the terra-cotta when the stoves are overheated, bolts and screws pass through the cylinders and terra-cotta, uniting them in one compact whole. A disc or plate with extra holes is also fitted to ensure more complete combustion.

6,997.—GAUGE FOR CHIMNEYS: *R. Scharf* (Bernberg).—In the present method of building chimneys the walls are often built out of line, that is, in some parts they are narrow and some wide, and pieces of brick and mortar are allowed to project into the chimney. The result of this irregularity in the building is that such chimneys have little or no draught and are very troublesome. To prevent this, an iron cylindrical or oblong gauge is, according to this invention, used, with the sides movable or adjustable by means of a series of cogs or projections. This is built around, and then with a turn of the handle the sides are drawn slightly back and the gauge may be taken out.

10,060.—TENSION DEVICE FOR SAWS: *L. Chevenier.*—This invention is a method of simply tightening the frame of bow saws by an arrangement governed by an eccentric lever. It is designed to replace the old twisted cord used for the purpose of tightening the saw frame.

NEW APPLICATIONS FOR LETTERS PATENT.

JULY 10.—13,352, D. Cameron, Scale, Drawing-board, or Block to be used in connexion with the Measuring or Delineating of Buildings and other Structures, &c.—13,380, W. Defries, Glass Painting, and in Mosaic.

JULY 11.—13,422, P. Clark, Upholstery.—13,423, G. Killick, Heating and Circulating Water.—13,440, D. Morgan, Flushing Stench Traps and other Pipes and Passages, principally applicable to Water-closets and Sinks.—13,451, J. Jack, Preventing Windows Shaking Loose or Rattling.—13,464, G. Poore, Dry or Earth Closets.—13,479, F. Glass, Hydraulic Lifts and Cranes.

JULY 12.—13,510, L. Motley, Concrete and Metal Earth Block or Plate for Metallic Fencing, Standards, and Posts.—13,514, G. Croker, Gully Traps.—13,521, J. Johnson, Glue Pots.—13,524, T. Baker, Window-sash Fasteners.—11,543, R. Quine, Chimney Cowls or Ventilators.—13,558, H. Gregory, Lead Pigments.

JULY 13.—13,575, E. Williams and J. Thomas, Pipe Joints.—13,578, W. Hayhurst, Cramps.—13,582, W. Beath, Siphon Cisterns.—13,598, J. Fisher, Concrete and similar Pavements and Floorings.—13,612, J. Adlington, Flushing Cisterns.—13,616, T. Smith, Joints or Sockets for Soil and other Lead Pipes.—13,649, J. Olsen and another, Roofing Tiles.

JULY 14.—13,688, W. Phillips, Self-acting Cupboard Door Fastener.—13,693, T. J. & J. Claughton, Ventilators, Soil-pipe Terminals, &c.—13,703, T. Ryland and E. Bird, Wood Carving Machines.—13,705, J. Schardt, Holders or Clamps for Circular Saws.—13,733, R. Muir, Sewer Cleaner.—13,740, H. Johnstone and A. Jennings, Window Frames and Sashes.—13,794, E. and W. Kingsman, Roofing Buildings.—13,795, E. and W. Kingsman, Slates, Tiles, &c., for Roofing and Method of Laying same.

PROVISIONAL SPECIFICATIONS ACCEPTED.

7,397, G. Delalande, Lever Window-fastener.—8,233, G. Lawrance, Sanitary Closet Pan and Automatic Soil Pipe and Drain Disconnecter.—9,930, J. Renison, New Material for Making Varnish, &c.—10,160, J. Appleby, Ventilator.—10,542, J. Collins and H. Rae, Handles for Locks, Latches, &c.—10,647, W. Willis, Silent Action Siphon Flushing Cistern Apparatus, with Improved Valves Working by Means of Leverage from Seat of Water-closet.—10,649, J. Hamilton, Concrete and Artificial Stone Mantelpieces.—10,668, M. Gentry, Down-draft Smokeless Kiln for Brick Burning and Drying.—10,943, W. McCaig, Chimney Cans or Cowls.—11,255, J. Ryland, Machines for Carving Wood.—11,681, G. Worrall, Door Locks and Night Latches.—11,809, J. Melling, Treads of Stairs, Door Steps, Landings, Floorings, &c.—11,865, J. and A. Gray, Siphon Cistern for Water-closets, &c.—11,888, M. Miller, Sewer Gulleys.—12,134, B. Budding, jun., Ventilator or Cowl.—12,185, W. Rooke, Ring Sash Lifts, &c.—12,228, J. Banks, Metallic Sheathing or Coverings for Columns and other Structural Parts of Buildings.—12,274, H. Flood, Swivelling Doors.—12,447, J. Reynolds, Fresh Air Inlet to be Fixed at the Side of Sewer Manholes.—12,618, A. Burgiss and R. Wilson, Window-sashes. — 12,643, J. Pearson, Apparatus for Moistening Air and Ventilating Purposes.—12,679, F. Smale, Window Sashes.—12,692, M. Negus and J. Stanford, Bakers' Ovens.—13,077, S. Wilson, Stoves or Grates.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

3,453, F. Horne, Prevention of Condensation on Windows.—10,303, J. Müller, Process for Manufacturing Paint.

SOME RECENT SALES OF PROPERTY;

ESTATE EXCHANGE REPORT.

JULY 15. — By *Messrs. Spelman* (at Norwich): 51 a. 2 r. 8 p., "Church Farm," Beighton, part c. and part f., 955*l.*; enclosures of land, 20 a. 0 r. 27 p., 605*l.*; five f. cottages, and 1 a. 2 r. 5 p., 165*l.*; f. marsh land, 19 a. 2 r. 36 p., Rockland St Mary, 400*l.*—By *Messrs. Cobb* (at Canterbury): Four enclosures of f. land, 45 a. 1 r. 23 p., near Ramsgate, 1,770*l.*

JULY 17.—By *Blake, Haddock, & Carpenter:* "Chart Lands Farm," 74 a. 1 r. 13 p., Limpsfield, Surrey, 4,100*l.*; "The Highlands" and 7 a. 1 r. 16 p., Horsham, Sussex, f., 1,900*l.*; two plots of f. land, 2¾ acres, Warlingham, 430*l.*; six plots of f. land, 706*l.*

JULY 18.—By *R. A. Notley:* 50, Tregunter-rd., Kensington, u.t. 55 yrs., g.r. 16*l.*, r. 90*l.*, 850*l.*—By *Holcombe & Betts:* 32, Charles-st., Hatton Garden, f., r. 80*l.*, 1,670*l.*—By *White, Druce, & Brown:* l.g.r. of 60*l.*, Edgware-rd., &c., Paddington, u.t. 27¾ yrs., no g.r., 830*l.*; l.g.r. of 58*l.* 16s., Cochrane-st., St. John's Wood, u.t. 26 yrs., g.r. 5*l.* 1s. 6d., 590*l.*—By *Field & Sons:* A plot of f. land, Fawcett-rd., Deptford, 80*l.*; 29, Alpine-rd., f., r. 35*l.*, 385*l.*; 291, 293, Lynton-rd., Bermondsey, u.t. 44 yrs., g.r. 6*l.* 6s., r. 58*l.* 16s., 450*l.*; f.g.r. of 15*l.* 15s., Reculver-

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Drainage and Water Supply Scheme.....	Truro U.R.S.A.	.....	Aug. 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Six Houses, Slaithwaite, Huddersfield....	.....	J. Berry	July 31
Iron Water Pipe, Kirknewton, N.B.....	Midlothian C. C.....	Leslie & Reid	do.
*Tooled York Paving.....	Bermondsey Vestry ..	*Official.....	do.
Drainage Works, Blackburn's Yards	Whithy Local Board..	do.	Aug. 1
Sewering, Paving, &c.....	Belfast Corporation ..	do.	do.
Road Works, Albion-road	St. Alban's Corp.	do.	do.
Hospital, Lake-y-carw, Amlwch, North Wales	Anglesey U.R.S.A.....	do.	do.
Sewering, Paving, &c. (twelve streets)	Nelson (Lancs.) Corp.	J. W. Bradley	do.
Pipe Sewers, &c. (325 yds.).....	do.	do.	do.
Drainage Works, Brighton-road	Aldershot Local Board	B. Rushford	do.
Railway Materials.....	Birmingham Corp.....	J. Mansergh	do.
Aisle and Vestries, St. Matthew's Church, Burnley	.....	W. Waddington & Son	do.
Two Houses, Burton Grange.....	Barnsley Town Council	J. H. Taylor.....	do.
Offices, Midmar, Aberdeen	Cluny Estates	Mr. Nicol	do.
Four Houses, &c. Moor-road, Thornhill, Yorks	W. Speight	.....	do.
Artisans' Dwellings (six blocks), Salford..	L. & Y. Ry. Co.	H. Shelmerdine	Aug. 2
Additions, &c. to Church, Cleator Moor, Cumberland	.....	Moffat & Bentley	do.
Paving and Sewering (Contracts Nos. 119-122).....	Rochdale Corporation	S. S. Platt.....	do.
Road Works, &c. Alfred-street.....	Ramsbottom Loc. Bd.	A. W. Smith.....	do.
School Buildings, Netherfield, Notts.....	Carlton School Board	R. Whitbread	Aug. 3
Granite Spalls (200 tons).....	Chatham Corporation	Chas. Day	do.
*Staff Blocks, S. E. Hospital	Met. Asylums Board..	Quilter & Wheelhouse	do.
*Laundries at S. E. Hospital	do.	T. W. Aldwinckle	do.
*Sewerage Works (Contract No. 29).....	Toxteth Park (Liverpool) Local Board....	J. Price	Aug. 4
Farm Buildings, &c. Haddo House, Aberdeen	.....	C. W. Sleigh.....	do.
Vestry, Gwaelod-y-Garth, Wales.....	Committee	E. Watkins	do.
Mill, Morley, Yorks.....	Morley Cloth Finishing Co.	.....	do.
Sinking Well	Clonakilty (Ireland) Union	N. Jackson	do
House and Offices, Rockwood Hill, Ryton	J. J. Davison	Wm. Allen.....	Aug. 5
Police Station, Malton.....	.....	Walker Stead	do.
Drainage Works, Ely	Cardiff U.R.S.A.....	W. Fraser	do.
Additions, &c. to School Buildings, Brynda, near Bridgend	E. Knox.....	G. F. Lambert.....	do.
Sewers, &c.	Chorley(Lancs.)U.R.S.A	A. Jolly	do.
Road Metal	Ryton (Parish) Local Board	J. P. Dalton	do.
Granite Road Metal (1,600 tons)	Woodford Local Board	C. Mathew.....	Aug. 8

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Road Making and Paving Works.....	Willesden Loc. Bd. ..	O. Claude Robson	Aug. 8
Pipe Laying (five miles), near Leeds	Hunslet U.R.S.A.....	J. H. Rhodes.....	do.
*Engine House, &c. &c.....	Tottenham Local Board	J. E. Worth	do.
*Passenger Station, &c. Stoke Canon	G. W. Ry. Co.	*Official	do.
*Passenger Station, &c. Ivybridge.....	do.	do.	do.
*Passenger Station, &c. Durston	do.	do.	do.
*Construction of Roads, Drainage, &c.	Grimsby U.S.A.	M. Petree	Aug. 9
*Drainage Improvements, &c.	do.	do.	do.
Road Making, Downpatrick, Ireland.....	Hon. Somt. Ward	.....	do.
Additions to School Buildings, Abersaman	Aberdare Sch. Bd.	T. Roderick	do.
Additions, &c. to School Buildings, Spon-street	Coventry Sch. Bd.	G. & J. Steane	do.
*Erecting Lecture Room	Queen Elizabeth's Sch. Barnet	J. Ladd	Aug. 10
*Public Offices	Shepton Mallet L. B.	G. J. & F. W. Skipper	do.
*Electric Lighting Works	St. Pancras Vestry....	Prof. H. Robinson	do.
*Strengthening Foot Bridge at Mucking Light House.....	Trinity House Corp. ..	*Official	do.
*Post Office, Burnley	Com. of H.M. Works..	do.	Aug. 11
*Builders' Carts and Vans, Water Carts, &c.	LondonCounty Council	do.	do.
School Buildings, Wrotham-road	Gravesend (U.D.) Sch. Board	Messrs. Cobham	Aug. 14
School Buildings, Pontypridd	Warehouses, &c. Southampton Docks	A. O. Evans	do.
*Post Office, Maidenhead.....	L. & S.W. Ry. Co.	*Official.....	Aug. 15
*Chimney Shaft, Subway, &c.	Com. of H.M. Works..	do.	do.
*Pipes, &c. for Main Sewers	St. Pancras Vestry....	do.	Aug. 16
Two Houses, St. Paul's-road, Peterborough	Canterbury U.S.A.....	Frank Baker	Aug. 28
Sewering, Kerbing, &c, ...	.....	W. Bowyer	No date
Two Pairs of Villas, Harrow and Croydon	Governors of Wakefield Charities	W. Watson	do.
Excavating (2,000 cubic yds.) Cardiff.....	J. Hargreaves	J. Rookwood	do.
Four Houses, Colney Hatch Lane, Muswell	.....	W. Galloway.....	do.
Brick Chimney, Cleckheaton	.....	H. Vulliamy.....	do.
House and Stable, Kirkstall, Leeds	.....	J. Young	do.
Additions, &c. Manor House, Kilmeston, Winchester.....	.....	W. Robshaw & Son....	do.
Vicarage House, Stoke Gabriel, Devon....	.....	W. H. Veysey	do.
Shaft Sinking, Glass Houghton, Castleford	T. H. Thorp	W. Taprell Allen.....	do.
*Grand Stand, Plumstead	Woolwich Arsenal Football and Athletic Co. Limited	.....	do.
*Painting Works, Wrexham Barracks	War Department	*Official	do.
		do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Surveyor, &c. Cymmer, Wales.....	Glyncorrwg Loc. Bd.	120*l.*	Aug. 5
*Highway and Drainage Surveyor	Hull Corporation	200*l.*	Aug. 9
*Chief Engineering Assistant.....	do.	160*l.*	do.
*Clerk of Works	Grimsby U.S.A.	3*l.* 3*s.*	do.

Those marked with an Asterisk (*) are advertised in this number. Contracts pp. iv., vi., viii., *and* xx. *Public Appointments, pp.* xviii.

rd., Rotherhithe, reversion in 78 yrs., 350*l.*; f.g.r. of 9*l.* 5*s.*, Reculver-rd., reversion in 78 yrs., 200*l.*; 21, Guildford-rd., Greenwich, u.t. 65 yrs., g.r. 4*l.*, 250*l.*—By *Humbert, Son, & Flint:* 17, 18, 19, 20, Lampton-rd., Hounslow, u.t. 82 yrs., g.r. 48*l.*, 515*l.*; i.g.r. of 25*l.*, Lorrimore-rd., Walworth, u.t. 56 yrs., g.r. 18*l.*, 110*l.*; i.g.r. of 45*l.*, u.t. 58 yrs., g.r. 31*l.* 10*s.*, 210*l.*; i.g.r. of 46*l.* 4*s.*, Carter-st., u.t. 52 yrs., g.r. 29*l.*, 270*l.*; i.g.r. of 17*l.* 10*s.*, u.t. 51 yrs., g.r. 11*l.* 5*s.* 4*d.*, 105*l.*; i.g.r. of 43*l.*, Lorrimore-sq., u.t. 52 yrs., g.r. 23*l.*, 320*l.*; a plot of f. land, Ross-rd., Wallington, 170*l.*—By *Messrs. Cobb* (at Ashford): Enclosures of pasture land, 9 a. 2 r. 38 p., Romney Marsh, Kent, f., 410*l.*—By *Rogers, Chapman, & Thomas:* l.g.r. of 1,077*l.*, "Belgrave Mansions," Belgrave, sold before auction; i.g.r. of 216*l.*, Alderney-st., Pimlico, u.t. 38 yrs., g.r. 19*l.*, reversion for 2 yrs., 3,341*l.*; i.g.r. of 56*l.*, u.t. 37 yrs., g.r. 7*l.*, reversion for 3½ yrs., 846*l.*; i.g.r. of 8*l.*, Warwick-st., u.t. 38 yrs., g.r. 1*l.*, reversion for 2 yrs., 121*l.*; i.g.r. of 9*l.*, u.t. 35 yrs., g.r. 10*s.*, reversion for 5¾ yrs., 144*l.*; i.g.r. of 59*l.*, Sussex-st., u.t. 38 yrs., g.r. 5*l.* 10*s.*, reversion for 2 yrs., 884*l.*

JULY 19.—By *Messrs. Cobb* (at Faversham): Two enclosures of f. woodland, 18 a. 0 r. 16 p., near Faversham, 680*l.*; f. cottage, woodland and hop land, 24 a. 3 r. 27 p., 720*l.*; an enclosure of arable land, 2 a. 0 r. 36 p., 40*l.*; f. house and 2 a. 3 r. 33 p., 415*l.*; three cottages and land, r. 19*l.* 14*s.* 4*d.*, 320*l.*——By *A. A. Hollingsworth:* 3 to 9 (odd), Arundel-st., Bethnal Green, u.t. 26 yrs., g.r. 20*l.*, 425*l.*; 10, 11, 12, Waterloo Ter.; 18 and 33, Nottingham-st.; 24, 26, Anglesea-st.; and 1, 2, Mary Pl., u.t. 25 yrs., g.r. 35*l.*, 515*l.*—By *Rogers, Chapman, & Thomas:* Igr. of 8*l.* 10*s.*, Winchester-st., Pimlico, u.t. 34 yrs., g.r. 10*s.*, reversion 6 yrs., 129*l.*; i.g.r. of 62*l.*, u.t. 37 yrs., g.r. 4*l.* 10*s.*, reversion 3½ yrs., i.g.r. of 56*l.*, u.t. 34 yrs., g.r. 3*l.*, reversion 5¾ yrs., i.g.r. of 50*l.*, u.t. 35 yrs., g.r. 3*l.*, reversion 5¾ yrs., i.g.r. of 72*l.*, u.t. 36 yrs., g.r. 4*l.*, reversion 4¾ yrs., i.g.r. of 54*l.*, u.t. 36 yrs., g.r. 1*l.* 4*s.*, reversion 4 yrs., 4,535*l.*; i.g.r. of 27*l.*, Denbigh-pl., u.t. 38 yrs., g.r. 3*l.*, reversion 6¼ yrs., 485*l.*; i.g.r. of 10*l.* 10*s.*, u.t. 38 yrs., g.r. 1*s.*, reversion 6¼ yrs., 188*l.*; i.g.r. of 14*l.*, St. George's-rd., u.t. 24 yrs., g.r. 1*s.*, reversion 17½ yrs., 400*l.*; i.g.r. of 160*l.*, Westmoreland-st., u.t. 37 yrs., g.r. 10*l.*, reversion 8 yrs., 2,750*l.*—By *Flood & Sons:* 64, 66, Tunis-rd., Uxbridge-rd., u.t. 87 yrs., g.r. 12*l.*, 300*l.*—By *G. W. Dixon & Co.:* 6 to 12 (even), Stanbury-rd., Peckham, u.t. 83 yrs., g.r. 18*l.*, 740*l.*—By *Inman Sharp, Harrington, & Roberts:* No. 87, Bishopsgate-st. Without, f., r. 150*l.*, 2,700*l.*; i.g.r. of 100*l.* 8*s.*, Princess-st., Edgware-rd., u.t. 28 yrs., g.r. 37*l.* 16*s.*, 585*l.*; i.g.r. of 42*l.* 15*s.*, Richmond-st., &c., u.t. 28 yrs., g.r. 19*l.* 19*s.*, 225*l.*; 12, Moore-st., Cadogan-sq., u.t. 49 yrs., g.r. 8*l.*, 710*l.*; 79, Osnaburgh-st., Regent's-pk., u.t. 31 yrs., g.r. 11*l.*, r. 55*l.*, 400*l.*; i.g.r. of 29*l.* 8*s.*, Robert-st., u.t. 30 yrs., g.r. 10*l.* 10*s.*, 195*l.*; i.g.r. of 62*l.*, Cumberland Market, u.t. 31 yrs., g.r. 20*l.*, 430*l.*; i.g.r. of 54*l.*, Clarence-gardens, u.t. 30 yrs., g.r. 12*l.*, 550*l.*; "Wellbourn Hall," Lincolnshire, and 65 a. 3 r. 20 p., f., 3,600*l.*; enclosures of meadow land, 7 a. 3 r. 25 p., f., r. 18*l.*, 270*l.*

JULY 20.—By *E. & F. Swain:* 103, Holland-rd., Kensington, f., 1,000*l.*—By *Higgins & Son:* No. 91, St. John's Wood-ter., u.t. 41 yrs., g.r. 6*l.*, r. 44*l.*, 465*l.*; 18, Ordnance-rd., u.t. 41 yrs., g.r. 7*l.*, r. 45*l.*, 405*l.*—By *J. H. Hunter:* 103, Star-street, Edgware-rd., u.t. 28 yrs., g.r. 6*l.* 6*s.*, r. 70*l.*, 550*l.*; 31, Cuthbert-st., u.t. 45 yrs., g.r. 7*l.* 7*s.*, r. 32*l.*, 330*l.*; 62, Hall-pl., u.t. 45 yrs., g.r. 7*l.* 7*s.*, r. 33*l.*, 330*l.*; 32, Waverley-rd., Harrow-rd., u.t. 56 yrs., g.r. 5*l.*, r. 32*l.*, 260*l.*—By *Lilley & Weston:* 1, 2, 3, Albert Cottages, Edgware, f., 310*l.*—By *Pinder, Simpson, & Newman:* Two cottages and plot of land, Northwood, f., r. 23*l.* 2*s.*, 360*l.*; an enclosure of f. land, 0 a. 1 r. 25 p., 525*l.*—By *Newbon & Co.:* 142, Grundy-st., Poplar, f., r. 28*l.*, 315*l.*; Nos. 99, 100, 100A, and 101, Bunhill Row, f., area 4,000 ft., 5,000*l.*; 89, 91, Harrow-rd., Paddington, u.t. 43 yrs., g.r. 40*l.*, r. 120*l.*, 860*l.*; 15 to 18, Church-pl., u.t. 43 yrs., g.r. 50*l.*, r. 130*l.*, 860*l.*; 12, 13, Wellings-pl., u.t. 44 yrs., no g.r. r. 30*l.*, 230*l.*; 14, Wellings-pl., u.t. 44 yrs., g.r. 6*l.* 6*s.*, r. 32*l.*, 355*l.*; l.g.r. of 6*l.* 6*s.*, Wellings-pl., u.t. 44 yrs., r. 125*l.*—By *Stimson & Sons:* 31, Pepy's-rd., New Cross, u.t. 68 yrs., g.r. 12*l.* 10*s.*, 500*l.*; 7 to 11, Norfolk-st., Vauxhall, and 12, 13, Cottage-pl., f., 810*l.*; 104, Lillington-st., Pimlico, u.t. 32 yrs., g.r. 6*l.* 6*s.*, r. 42*l.*, 365*l.*; 21, 23, 25, Haymerle-rd., Old Kent-rd., u.t. 37 yrs., g.r. 22*l.* 10*s.*, 220*l.*; 26, 28, 30, Sefton-st., Putney, u.t. 70 yrs., g.r. 7*l.* 10*s.*, 390*l.*; 38, Guildford-rd, Poplar, u.t. 183 yrs., g.r. 5*l.*, r. 24*l.*, 200*l.*; 24, Albany-rd., Stroud Green, u.t. 95 yrs., g.r. 10*l.*, r. 63*l.*, 650*l.*; 106, 132, Lilley-rd., Brompton, u.t. 80 yrs., g.r. 18*l.*, r. 100*l.*, 980*l.*; 1, Fawcett-st., u.t. 69 yrs., g.r. 10*l.*, 320*l.*; range of stabling in Fawcett Mews, u.t. 69 yrs., g.r. 25*l.*, 800*l.*—By *Farebrother, Ellis, & Co.:* Nos. 196, 197, 198, Strand, f., 35,400*l.*; Nos. 194, 195, 226, Strand, f., 27,350*l.*—By *H. J. Bliss & Sons:* F.g.r. of 10*l.*, Campbell-rd., Finsbury-pk., reversion in 72 yrs., 205*l.*; f.g.r. of 5*l.*, Fonthill-rd., reversion in 73 yrs., 125*l.*; f.g.r. of 26*l.*, William-st., Notting Hill, reversion in 50 yrs., 570*l.*; f.g.r. of 8*l.*, Queen's-rd., reversion in 47 yrs., 170*l.*; f.g.r. of 5*l.*, Queen's-pl., reversion in 49 yrs., 110*l.*; f.g.r. of 8*l.*, Maryland-st., Stratford, reversion in 61 yrs., 215*l.*; 100, Weymouth-ter., Hackney, f., 265*l.*; 56, 58, 60, Moss-st., Bethnal Green, f., 615*l.*; 19, Warley-st., f., 235*l.*; 2, 6, 8 Groombridge-rd., Hackney, u.t. 60 yrs., g.r. 17*l.*, r. 108*l.*, 950*l.*; 26, 29, 30, Queen Ann-rd., ut. 52 yrs., g.r. 15*l.* 10*s.*, 710*l.*; 6 to 12 (even), Bradstock-rd., u.t. 57 yrs., g.r. 21*l.*, 985*l.*; 57, Driffield-rd., Old Ford, f., 410*l.*

JULY 21.—By *G. A. Wilkinson & Son:* 24, Pembroke Gardens, Kensington, u.t. 52 yrs., g.r. 8*l.*, r. 100*l.*, 950*l.*; 7, 8, 9, Grange-rd., Ealing, u.t. 75 yrs., g.r. 46*l.*, r. 325*l.*, 3,970*l.*—By *Moss & Jameson:* l.g.r. of 42*l.*, Sussex-st., Poplar, u.t. 60 yrs., g.r. 12*l.*, 510*l.*—By *F. Jolly & Co.:* 38, 39, 40, Longfellow-rd., Mile End, f., 770*l.*—By *V. Vaughan:* 17, Southampton-st., Fitzroy-sq., f., r. 160*l.*, 3,000*l.*; 5, Fitzroy-sq., and stabling, f., r. 135*l.*, 3,320*l.*, f.g.r. of 12*l.*, Beaconsfield Ter., Finchley, reversion in 12 yrs., 260*l.*; No. 113, Hampstead-rd., f., 1,940*l.*—By *Baker & Sons:* 17, 19, 50, 52, St. Mary's-rd., Edmonton, u.t. 78 yrs., g.r. 16*l.*, 290*l.*; 1, 3, St. Joseph-rd., u.t. 78 yrs., g.r. 8*l.*, 130*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	9/0/0 0/0/0
Teak, E.I. ..	load	9/0/0 15/0/0
Sequoia, U.S.ft.cu.		2/3 2/6
Ash, Canada load		2/15/0 4/0/0
Birch, do.		2/15/0 3/5/0
Elm, do.		3/10/0 4/15/0
Fir, Dantsic, &c.		1/5/0 2/15/0
Oak, do.....		3/0/0 5/5/0
Canada		5/10/0 7/0/0
Pine, Canada red		2/5/0 2/15/0
Do. Yellow ..		3/5/0 4/10/0
Lath, D'ntsic, fath		4/10/0 5/10/0
St. Petersburg..		5/0/0 6/10/0
Wainscot, Riga, &c., log		3/0/0 3/10/0
Odessa, crown		4/0/0 5/0/0
Deals, Finland and & 1st std 100		6/10/0 9/0/0
Do. 4th & 3rd ..		6/0/0 6/10/0
Do. Riga		6/10/0 8/0/0
St. Petersburg, 1st yellow		9/0/0 13/0/0
Do. 2nd yellow..		7/0/0 8/0/0
Do. white		8/0/0 10/0/0
Swedish		7/0/0 15/0/0
White Sea		7/0/0 15/10/0
Canada, Pine 1st		21/0/0 28/10/0
Do. do. 2nd		16/0/0 17/10/0
Do. do. 3rd &c.		7/10/0 10/5/0
Do. Spruce, 1st		8/10/0 11/0/0
Do. do. 3rd & 2nd		6/10/0 8/0/0
New Brunswick		6/0/0 7/10/0
Battens, all kinds		3/0/0 15/0/0
Flooring boards, sq., 1 in. prep. 1st		0/0/6 0/14/6
Do. 2nd		0/7/6 0/11/6
Other qualities—		0/4/6 0/7/0
Cedar, Cuba ..ft.		/4 /4½
Honduras, ..&c		/4 /4½
Mahogany, Cuba		/4 /6½
St. Domingo, cargo av.		/3 1/6
Mexican do. do.		/3½ /4½
Tobasco do. do.		/3½ /6½
Honduras do. ..		/4½ /6
Box, Turkey ton		4/0/0 13/0/0
Rose, Rio		9/0/0 20/0/0
Bahia		8/0/0 18/0/0
Satin, St. Domingo .....ft.		0/0/6 0/1/2

TIMBER (*continued*).

Satin, Porto Rico	0/0/7	0/1/6
Walnut, Italian ..	0/0/3½	0/0/7

METALS.

Iron—Pig, in Scotland .....ton	2/1/10	2/2/0
Bar, Welsh, in London ..	5/17/6	6/0/0
Do. do. at works in Wales.....	5/7/6	5/10/0
Do. Staffordshire, in London.....	6/0/0	6/10/0
COPPER—British, cake and ingot	46/0/0	46/10/0
Best selected ..	47/0/0	47/10/0
Sheets, strong ..	54/0/0	0/0/0
Chili, bars	42/7/6	42/15/0
YELLOWMETAL	0/0/4½	0/0/5
LEAD—Pig, Spanish.....ton	9/17/6	0/0/0
English com. brands	10/0/0	0/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards....	11/0/0	0/0/0
Pipe.....	11/10/0	0/0/0
ZINC—English sheet.....ton	22/0/0	0/0/0
Vieille Montagne	22/10/0	0/0/0
TIN—Straits.....	82/10/0	83/0/0
Australian.....	85/0/0	85/10/0
English Ingots..	87/0/0	87/10/0
Banca	90/0/0	0/0/0
Billiton	88/10/0	88/15/0

OILS.

Linseed .....ton	20/17/6	21/0/0
Cocoanut, Cochin	29/0/0	0/0/0
Do. Ceylon	27/0/0	0/0/0
Palm, Lagos.....	26/10/0	0/0/0
Rapeseed, English pale	24/10/0	25/0/0
Do. brown	23/0/0	0/0/0
Cottonseed ref....	22/0/0	23/10/0
Oleine	22/0/0	23/10/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/10/0	12/0/0
TAR—Stockholm barrel	0/18/6	0/0/0
Archangel	0/12/6	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

BLABY (Leicester).—For the erection of hospital for the Union Rural Sanitary Authority. Mr. W. H. Simpson, surveyor, Alliance Chambers, Horsefair-street, Leicester. Quantities by architect:—

Chas. Sharp	£4,220 0 0	J. Duxbury	£3,849 0 0
Geo. Groves	4,170 0 0	F. Bland	3,835 0 0
Messrs. Halford & Sons	4,075 0 0	E. Elliott	3,815 0 0
Mr. J. Wright	3,982 15 0	Geo. Hewitt	3,789 0 0
Messrs. T. S. Glover & Sons	3,915 12 7	J. O. Jewsbury, Leicester*	3,720 0 0

* Accepted.

[Surveyor's estimate, £3,991 12 0.]

For Roadmaking, &c,

Thos. Philbrick	£691 7 10	J. Mason	396 8 3
S. & E. Bentley	684 0 0	J. Holme	381 19 0
Messrs. Halford & Son	405 0 0	Hutchinson & Sons Leicester*	348 5 0

[Surveyor's estimate, £381 0 0.]

* Accepted.

BOURNEMOUTH.—For the erection of a small Baptist chapel, Heatherlands. Messrs. Lawson & Donkin, architects, Yelverton-chambers, Bournemouth:—

T. Dean	£473 0 0	J. Hillman	£377 17 6
Messrs Entwisle & Cox	425 0 0	J. Gulliver	374 0 0
W. J. Chinchen	380 0 0	W. H. C. Curtis	359 0 0
		W. Piercy, Poole*	333 15 0

* Accepted.

BURY (Lancs.).—For the extension of leather works, Chesham, for Mr. R. Stott. Mr. Thos. Wilde, architect, 12, Cook-street, Bury:—

John Tinline	£349 5	Samuel Clough	£345 0
Thomas Ashworth	347 0	John Smith & Sons, Bury*	344 0

* Accepted.

CANTERBURY.—For the erection of a mortuary and works in connexion, at the County Asylum, Chartham Downs, for the Committee. Messrs. Stenning & Jennings, architects, Canterbury:—

Gentry	£620	Knock	£530
Moody	575	Quested	527
W. & T. Denne	547	Mount, Canterbury *	523
Brewster	538	W. Judges	383

* Accepted.

CARDIFF.—For additions to Wood-street Congregational Church, Cardiff. Messrs. Habershon & Fawckner, architects, Newport and Cardiff:—

Hodgkinson	£3,150	Turner & Sons	£2,388
D. J. Davies	3,000	Thomas & James	2,362
H. Davies	2,477		

[All of Cardiff.]

CARDIFF.—For lavatories, class-room, and other additions to Roath-road Chapel, for the Wesleyan Conference. Messrs. Habershon & Fawckner, architects, Newport and Cardiff:—

Howell & Co.	£348	Hallett & Sons	£200

CARLISLE.—Accepted for erecting a Christian meeting-house and school, Edward-street, Carlisle. Mr. H. Higginson, architect, Carlisle. Quantities by the architect:—

Builder's work.—Gordon & Logan, Lonsdale-street	£809 0
Joiner's work.—J. H. Reed, Edward-street	365 15
Plumber's work.—G. Sowerby, King's Arms-lane	71 0
Slater's work.—C. J. Nanson, Lowther-street	61 10
Plasterer's work.—S. Ferguson & Sons, Denton-street	94 0
Glazier's work.—R. Westray, Lowther-street	57 0
All of Carlisle.	
Total	1,458 5

CARLISLE.—Accepted for the erection of vagrant wards at the workhouse, Fusehill, for the Guardians of the poor, Carlisle Union. Mr. H. Higginson, architect, Carlisle. Quantities by the architect:—

Builder's Work.—R. Johnstone, London-road	£430 13 3
Joiner's Work.—T. & J. Nixon, West Walls	180 0 0
Plumber's Work.—J. W. Smith, Lowther-street	71 9 0
Slater's Work.—D. Armstrong, Finkale-street	74 5 0
Plasterer's Work.—S. Ferguson & Sons, Nelson-street	44 0 0
Painter's Work.—T. Palmer, Church-street	21 7 0
	821 14 3

CHERITON (near Folkestone).—For new Vicarage. Mr. Ewan Christian, architect, Whitehall-place, S.W.:—

Dove Bros.	£2,417	Hayward & Paramor	£2,014
Wallis	2,112	Burvill	1,992
Wise	2,078	Paramore, Margate*	1,932
Adcock	2,059		

* Accepted.

CLACTON-ON-SEA.—For the erection of school buildings, St. Osyth-road, for the Great Clacton School Board. Mr. T. H. Baker, architect, Colchester and Clacton-on-Sea. Quantities by the architect:—

G. Abbot	£3,055	Bell & Son	£2,870
Orfeur	3,035	Everitt & Sons	2,840
Whitely	3,028	Ellis & Turner	2,750
Demaid	2,970	West	2,747
Uwins	2,011	Linzell, Newmarket*	2,638
Dobson	2,880		

* Accepted.

[Architect's estimate, £2,675.]

CLAVERING (Essex).—For constructing culverts and roadways over fords, for the Essex County Council. Mr. P. J. Shelton, engineer. Quantities by Mr. G. Lamb, 76, East-street, Barking:—

Staines	£3,009 0 8	Dix & Sons	£2,283 18 10
Bell & Sons	2,923 4 0	Parmenter, Brocking (accepted)	2,261 2 0
Griffiths	2,830 7 8		

[Engineer's estimate, £2,440.]

CLEETHORPES (Yorks).—For flagging (12,500 super. yards); kerbing, channelling (8,800 lineal yards); granite paving (650 super. yards), for the Local Board:—

W. H. Richards	£6,104 4 6	Jas. Ireland	£5,425 6 8
B. Robinson	6,019 6 6	Patent Victoria Stone Co., London†	5,495 15 6
F. Walker	5,820 2 6	Adamant Co.	5,168 15 0
C. Simons	5,697 10 6	Granite Co.	5,121 11 7
R. Clarke, Sheffield*	5,514 0 11½	Thos. Wilkinson	5,110 1 2
Rhodes Bros.	5,480 11 10		

Flagging Only.

G. Colbridge	£3,811 4 2	Jones Annealed Concrete Co.	£3,132 0 0
Imperial Stone Co.	3,637 3 2		

Curbing, Channelling, and Granite Setts Paving.

W. H. Wheeler £2,211

* Accepted for curbing, channelling, and granite setts paving.
† Accepted for flagging with Victoria Stone.

CORK.—For alterations, &c., to premises, Paradise-place and Court-lane, for the Committee of the Cork Young Men's Society. Mr D. J. Coakley, architect, South Mall Cork:—

Thomas Lamb	£766	Denis Ford	£619
Denis O'Callaghan	724	Terence O'Flynn, Cork*	600

* Accepted.

DEVONPORT.—For the erection of a boundary wall, &c., Fore-street, for the Town Council. Mr. Jno. F. Burns, Borough Surveyor, Municipal Offices, Ker-street, Devonport:—

J. Healy & Son	£737 0 0	S. Perkins	£626 12 3
T. Jenkin & Son	723 10 0	W. Lapthorne	625 0 0
Shillabere	722 0 0	Roach & Lovell	621 15 0
W. Shaddock	708 12 4	Kerswill, Plymouth	559 0 0
Parsons & Son	638 13 3		

* Accepted.

DEWSBURY.—Accepted for the erection of cottage homes, Heald's-road, Staincliffe, for the Guardians. Messrs. Holtom & Fox, architects, Dewsbury:—

Mason—Geo. Whitehead	£1,559 0 0
Joiners—Garthwaite & Blackburn	540 0 0
Plumber—F. Newsome	—
Plasterer—James Lockwood	65 0 0
Slater—T. Brear	99 0 0
Painter—N. Ramsden	34 0 0

[All of Dewsbury.]

DURHAM.—Accepted for the erection of six dwelling-houses, Atherton-street, for the Durham Co-operative Society, Limited. Mr. J. Henry, architect, 11, North Bailey, Durham:—

Bricklayers' work.—W. & R. Blackett, Bishop Auckland	£620 0 0
Joiner.—G. Lazenby, Ferry Hill	338 14 0
Plasterer.—T. Nesbitt, Durham	88 7 0
Slater.—T. W. Blakey	60 14 4
Plumbers.—Heron & Brown	74 5 0
Painters.—T. Hopper & Son	27 2 5

DURHAM.—For widening Chester-le-Street county bridge over the Chester Burn, for the County Council. Mr. W. Crozier, Engineer, Shire Hall, Durham. Quantities by Mr. I. Ezra Miller, 1, Tunstall-road, Sunderland:—

W. C. Atkinson	£860 17 8	J. Thompson & Son, Chester-le-Street	£648 7 4
John Geo. Gradon	815 11 6		

* Accepted.

GATESHEAD.—For the erection of a branch store, Whitehall-road, for the Gateshead Co-operative Society, Limited. Mr. Edwin Bowman, architect, 62, Grainger-street, Newcastle-on-Tyne. Quantities by Mr. Geo. Bell, Newcastle:—

Alex. Bruce	£6,108 14 2	James Lunn	£5,546 18 9
J. Elliot	6,100 0 0	H. Brown & Co.	5,524 18 9
W. C. Tyrie	6,016 10 0	Haswell & Waugh	5,515 0 0
Middlemiss Bros.	6,014 0 0	J. & W. Lowry	5,498 0 0
J. C. Hope	5,821 4 0	T. J. White	5,403 3 2
F. Wakefield	5,667 0 0	R. McKew	5,349 12 7
Alex. Pringle, Gateshead*	5,589 0 0	Raven & Hitcham	5,167 14 10

* Accepted.

GRAYS (Essex).—For the erection of a Baptist Tabernacle, Orsett-road, for the Rev. J. Heywood. Mr. Charles Cobham, architect, Shakespeare Villas, Grays. Quantities by the architect:—

G. B. Rons	£2,027 17	W. H. Wayfield	£1,591 10
John Allen & Sons	1,950 0	W. H. Archer	1,577 0
H. R. Rons	1,769 7	J. Lawrence	1,565 0
J. Brown	1,680 0	H. J. Carter, Grays*	1,495 0

* Accepted.

HECKMONDWIKE (Yorks).—Accepted for the erection of six houses and a shop, Nab-lane, Mirfield, for Mr. Benjamin Barritt, of Mirfield. Mr. A. A. Stott, architect, Heckmondwike. Quantities by architect:—

Excavator, Mason, and Bricklayer.—Wm. Oates, Knowl, Mirfield	£1,334
Carpenter and Joiner.—O. Barker, Mirfield	
Plumber and Glazier.—Charles Fawthrop, Mirfield	
Plasterer.—Charles Brearley, Mirfield	
Slaters.—Samuel Johnson & Son, Mirfield	
Painters.—Knight & Jackson, Huddersfield	

HERNE BAY.—For erecting the first portion of a parochial institute. Mr. Ernest Turner, architect, 246, Regent-street, W.:—

Paramore	£1,470	Adams	£1,349
Welby	1,397	Ingleton, Herne Bay*	1,333

* Accepted.

LONDON.—For making-up and paving Ranelagh-avenue and Anselm-road, for the Fulham Vestry. Mr. W. Sykes, New Streets Surveyor, Town Hall, Walham Green, London, S.W.:—

	Anselm-road, Sec. II.				Ranelagh-avenue, Sec. I.			
	Roadway.	York.	Adamant.	Imperial.	Roadway.	Adamant.	York.	Imperial.
	£	£	£	£	£	£	£	£
Nowell & Robson	98	84	—	—	292	—	155	—
E. Parry	85 10	57	—	—	280	—	176 15	—
Wimpey & Co.	91	60 19	43 10	—	304	139	192	—
Rogers & Co.	98	70*	—	—	293	—	200*	—
Lawrence	103	—	—	—	320	—	—	—
H. J. Greenham	85	—	—	—	300	—	—	—
J. Mears	102	—	—	—	275	—	—	—
Imperial Stone Co.	—	—	—	48	—	—	—	136

* If roadway tender accepted £60 and £170.

LLANGEFNI (Anglesea).—For the construction of sewerage and water supply works at Llangefni, in the county of Anglesea, for the Llangefni Local Board. Messrs. Charles H. Beloe and Frank E. Priest, engineers, 7, Victoria-street, Westminster, London:—

Sewerage Works.

Sterling & Swann	£4,836 0	David Williams	£2,712 19
Evan Williams	3,351 0	Thomas Bugbird	2,500 0
Owen Morris	3,089 0	James Young & Son, 14, Aston-lane, Perry Barr, Birmingham*	2,089 0
John Weston	2,881 0		
G. Griffiths	2,877 0		

* Accepted.

Water Works.

Sterling & Swann	£4,500	Evan Williams	£3,286
John Weston	3,750	Thomas Bugbird	3,100
Owen Morris	3,510	James Young & Son, 14, Aston-lane, Perry Barr, Birmingham*	2,895
G. Griffiths	3,415		
David Williams	3,378		

* Accepted.

LONDON.—For fitting up shop premises at 23, Canonbury-lane, N. Mr. E. J. Harrison, architect:—

Wall Bros.	£347	Houghton & Son	£230
Thermen & White	243	Ward & Lamble	227

LONDON.—For sewering, levelling, &c., Sarah-place, Mary place, and Elgin-terrace, Woolwich, for the Local Board. Mr. H. O. Thomas, Surveyor, Town Hall, Woolwich:—

Jno. Brightmore	£176 10	Woodham, Fry, & Fry, Lewisham (accepted)	£9
Mowlem & Co.	110 0		

LONDON.—For alterations and sanitary works at No. 37, Commercial-street, E. Mr. Chas. H. Flack, architect:—

Bray	£280	R. Eddle	£277
Howell J. Williams	278		

LONDON.—For the erection of warehouse and show-rooms Blenheim-grove, Peckham, for Mr. W. Robinson. Mr. Robert Willey, architect and surveyor, 33, New Bridge-street, Blackfriars, E.C.:—

Rowe	£1,225	Tyreman	£1,127
Nightingale	1,180	Rider Hunt	1,056
Holliday & Greenwood	1,177	Parker	1,015
Williams	1,148	Richardson (accepted)	889
Burman	1,140		

LONDON.—For rebuilding business premises in Vere-street, W., for Messrs. Marshall & Snelgrove. Mr. Octavius Hansard, architect. Quantities by Mr. F. H. A. Hardcastle:—

Bywaters	£26,283	Hall, Beddall, & Co.	£25,100
Colls & Sons	25,496	Killby & Gayford	21,378
Holland & Hannen	25,384		

LONDON.—For alterations and repairs at the "Crown and Anchor," Drummond-street, Euston-road. Messrs. Thorpe & Furniss, architects. No quantities supplied:—

Voller	£822	Antil	£646
Gould & Brand	783	Lamble	619
H. & F. Fearman	673		

LONDON.—For proposed alterations to "The Victoria Hotel," Charterhouse-street, E.C., for Mr. J. S. Manley. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. Quantities supplied:—

Allen & Sons	£1,585	Gould & Brand	£1,357
A. Bush & Sons	1,477	D'Oyly & Co.	1,349
Antill & Co.	1,432	Ward & Lamble	1,339

Pewterer's Work.

J. Davidson	£153 10	Watts & Co.	£121 13
T. Heath	131 10	Sanders & Sons	120 0

Gasfitter's Work.

W. Winn	£125 0 0	Vaughan & Brown	£119 0 0
H. F. Grant	120 2 6	E. Pragnell	111 17 6

LONDON.—For alterations and additions to the "York Hotel," Waterloo-road, S.E., for Messrs. Deakin & Co. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. Quantities supplied by Mr. E. J. Sadgrove, 22, Surrey-street, Strand, W.C.:—

Ward & Lamble	£2,494	S. Goodall	£2,415
Young & Lonsdale	2,453	Gould & Brand	2,373
J. Anley	2,450	Spencer & Co.*	2,275
C. Dearing & Son	2,434		

* Accepted.

Pewterer's Work.

Watts & Co.	£115 10	F. J. Ruse	£99 5
Sanders & Sons	102 8	W. Helling (accepted)	98 0

Gasfitter's Work.

E. Pragnell (accepted) £47 0 0

LUCKNAM (Wiltshire).—Accepted for alterations and additions to mansion; also the drainage, sanitary work, and water supply at Lucknam, near Chippenham, under the superintendence of Mr. F. Colyer, architect, 18, Great George-street, Westminster, S.W.:—

No. 1 Contract.—Drainage and Sanitary Work, &c. (exclusive of Ground Work, Concrete, and Builder's Work).

G. Jennings, Lambeth, S.E. £1,200

No. 2 Contract.—Alterations and additions to the west wing.

W. Webb, Bath £445

MARAZION (Cornwall).—For the erection of a Wesleyan church. Mr. R. Pascoe, architect, Marazion:—

W. H. Stephens	£2,057	Miners & Hunkin	£1,640
T. R. Glasson	1,746	George Miners, Marazion*	1,633
W. Winn & Son	1,680		

* Accepted.

MARGATE.—For erecting residence at Cliftonville. Mr. Ralp Lowe, architect, Basinghall-street, London:—

Brown	£1,370	Martin	£1,095
Barwick	1,193	Robson	1,075
Woodward	1,150	Padgett	1,050
Wise	1,121	Doughty, Margate*	1,029
Paramore	1,100		

* Accepted.

NEASDEN.—For additions to schools. Messrs. Jas. Brooks & Son, architects, 35, Wellington-street, Strand:—

Tennant	£656	Wise	£559
Cowley & Dent	600	Thorne, Willesden*	508
Sharp	580		

* Accepted with deductions.

OXFORD.—For the erection of a block of buildings at the Radcliffe Infirmary. Messrs. Giles, Gough, & Trollope, architects, 28, Craven-street, Charing Cross, London, W.C. Quantities by Mr. C. H. Goode:—

J. D. Williams	£5,825 0	Garlick & Horton	£5,933 7
Orchard & Son	5,577 0	Kingerlee	5,227 0
Willcock & Co.	5,449 0	Parnell & Son	5,226 15
S. & W. Pattinson	5,447 0	Robinson	4,983 10
Bunning & Son	5,367 11	Claridge & Bloxham	
Wilkins & Sons	5,270 0	Banbury (accepted)	4,765 0

ROCHESTER.—For the formation of two roads, Cuxton, for the City of Rochester Land Company. Mr. J. W. Nash, surveyor, 7, Medway-terrace, Rochester:—

W. Coker	£225 0 0	E. G. Brown	£154 11 6
H. Brigden	220 0 0	J. C. Trueman, Swanley*	140 0 0
J. Willord	187 10 0		

* Accepted.

RYDE.—For the erection of a chapel in Newport-street, Ryde, Isle of Wight. Mr. John I. Barton, architect:—

Edwin James	£720	John Whitewood, Ryde*	£66
Isaac Barton	680		

* Accepted.

SANDWICH.—For building shop and stores. Mr. E. W. Fry architect, Dover :—

Denne	£1,140	Richardson	£1,070
Bromley	1,105	Hayward & Paramor	1,065
Stiff	1,100	Wise, Deal (accepted)	990

SHEERNESS.—For the extension and alteration of the Marine Town and Blue Town Board Schools, for the Minster-in-Sheppey School Board. Mr. W. Wallace Copland, architect :—

Laurance Seager	£914 0 0
George Pavey, Sheerness (accepted)	767 0 0

SHEFFIELD.—For the execution of a scheme of sewage disposal for the village of Ecclesfield, for the Wortley Union Rural Sanitary Authority. Mr. D. Balfour, engineer, 3, St. Nicholas-buildings, Newcastle-on-Tyne :—

J. Hill	£3,435	J. E. Naden	£2,129
C. Green	2,702	J. Jamieson	1,980
Townsend, Watson, & Gates	2,276	J. Carrick	1,826
G. Bell	2,199	G. Hall	1,739

SHEFFIELD.—For closets, urinals, &c., at Hillsboro' Park, Sheffield. Mr. C. F. Wike, City Surveyor :—

		With additions.
C. Skelton	£441 0 0	£538 10 0
John Morton	407 7 5	502 2 9
T. Ashforth	388 0 6	467 9 7
J. Bertram	372 9 1	462 9 9
S. Warburton, Manchester*	364 1 0	453 19 9

* Accepted.

STAINES.—For two pairs of cottages to be built in Egham Hythe, for Mr. Whittington. Mr. Ralph Fitt, architect, Staines :—

Gray	£856	Robinson & Francis	£812
Reavell	830	Harrison, Staines *	695

* Accepted for three pairs, £1,042 10s.

STAINES.—For a block of three cottages to be built in Staines, for Mr. C. Reeves. Mr. R. Fitt, architect, Staines :—

Bent	£954 12 8	Reavell, Staines *	£749 0 0
Harrison	875 0 0	Robinson & Francis	738 0 0

* Accepted.

STAINES.—For cleaning, painting, and sundry works to the undermentioned schools, for the Staines School Board. Mr. R. Fitt, architect and surveyor, Staines :—

	Thames-street.	London-road.	Bridge-street.
Powell	£105 0 0	£42 0 0*	£40 0 0*
Baker	97 14 0*	46 10 0	45 5 0

* Accepted.

STAINES.—Accepted for alterations and repairs at 15, Clarence-street, Staines, for Mr. E. T. Earee. Mr. Ralph Fitt, architect, Staines :—

Watson, Clapham	£205 18 0

TAUNTON.—For the erection of a children's ward, isolation wards, and a disinfecting apparatus chamber; and the provision of twelve nurses' bedrooms and quarantine quarters, at the Taunton and Somerset Hospital (The "William Liddon" Memorial). Mr. J. Houghton Spencer, architect, Taunton :—

S. Derham	£2,275	W. Potter	£2,060
J. Mountstephens	2,225	G. H. Pollard	2,036
A. J. Spiller	2,198	H. W. Pollard (accepted)	2,025
J. Morse	2,112	F. W. Rowsell (withdrawn)	1,920

TORPOINT (Devon).—For laying down 1,200 yards of water-mains, constructing service-tank, &c., for the St. German's Union Rural Sanitary Authority. Mr. S. P. Hosking, engineer, Landrake :—

C. White, Cowsand, near Plymouth	£240 10 0

UPPER WARLINGHAM (Surrey). — For the erection of stabling and coachman's dwelling at "Dorincourt." Mr. H. Phelps Drew, architect, 29, and 30, King-street E.C. :—

Hunter & Bryant	£1,087
Horrocks, Croydon*	1,060

* Accepted subject to modification.

WALMER.—For the restoration of the "Cambridge Arms Inn" after fire. Mr. G. E. Bond, architect, Rochester :—

Denne	£395	Wise, Deal	£295
Denne	319	* Accepted.	

WEST BROMWICH.—For the erection of a stone-breaking shed, &c., at the workhouse, for the Union Guardians. Mr. Thos. Rollason, architect, High-street, West Bromwich. Quantities by architect :—

John Mallin, West Bromwich	£190 0 0

WOLVERTON (Bucks).—Accepted for the erection of additions to envelope works, for Messrs. McCorquodale & Co., Limited, exclusive of new lift and heating arrangements. Mr. H. Phelps Drew, architect, 29, and 30, King-street, E.C. Quantities by the architect :—

Norton, Chelsea	£2,580

(Lowest of four tenders received.)

WOODFORD.—For erecting a pair of almshouses, and enlarging the Crêche and Y.M.C.A. buildings in connexion with the Grove-end Mission, Woodford, Essex, for the committee. Mr. J. J. Robson, architect :—

Stewart	£1,811 9 3	Hosking	£1,515 0 0
Holland	1,750 0 0	Wells	1,475 0 0
Osborn & Son	1,648 0 0		

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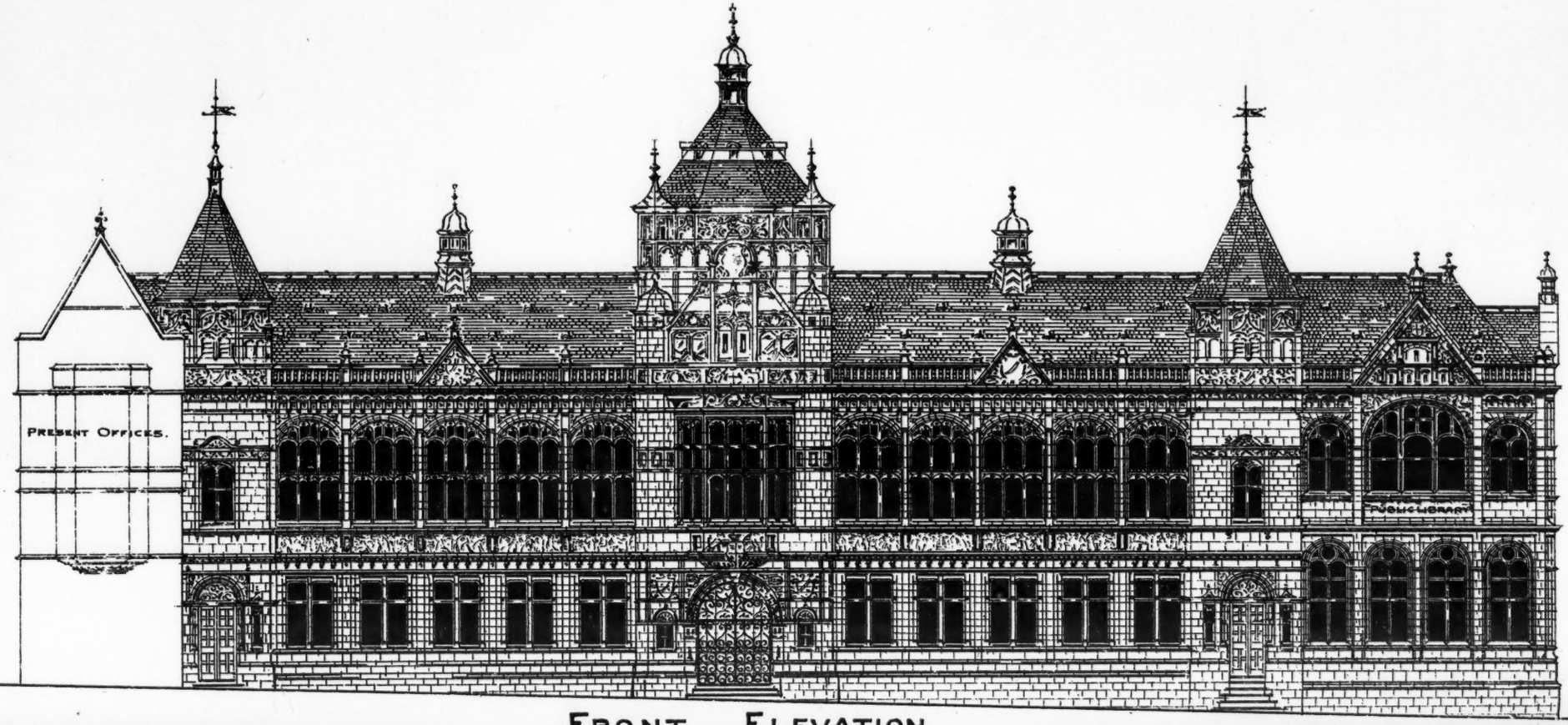

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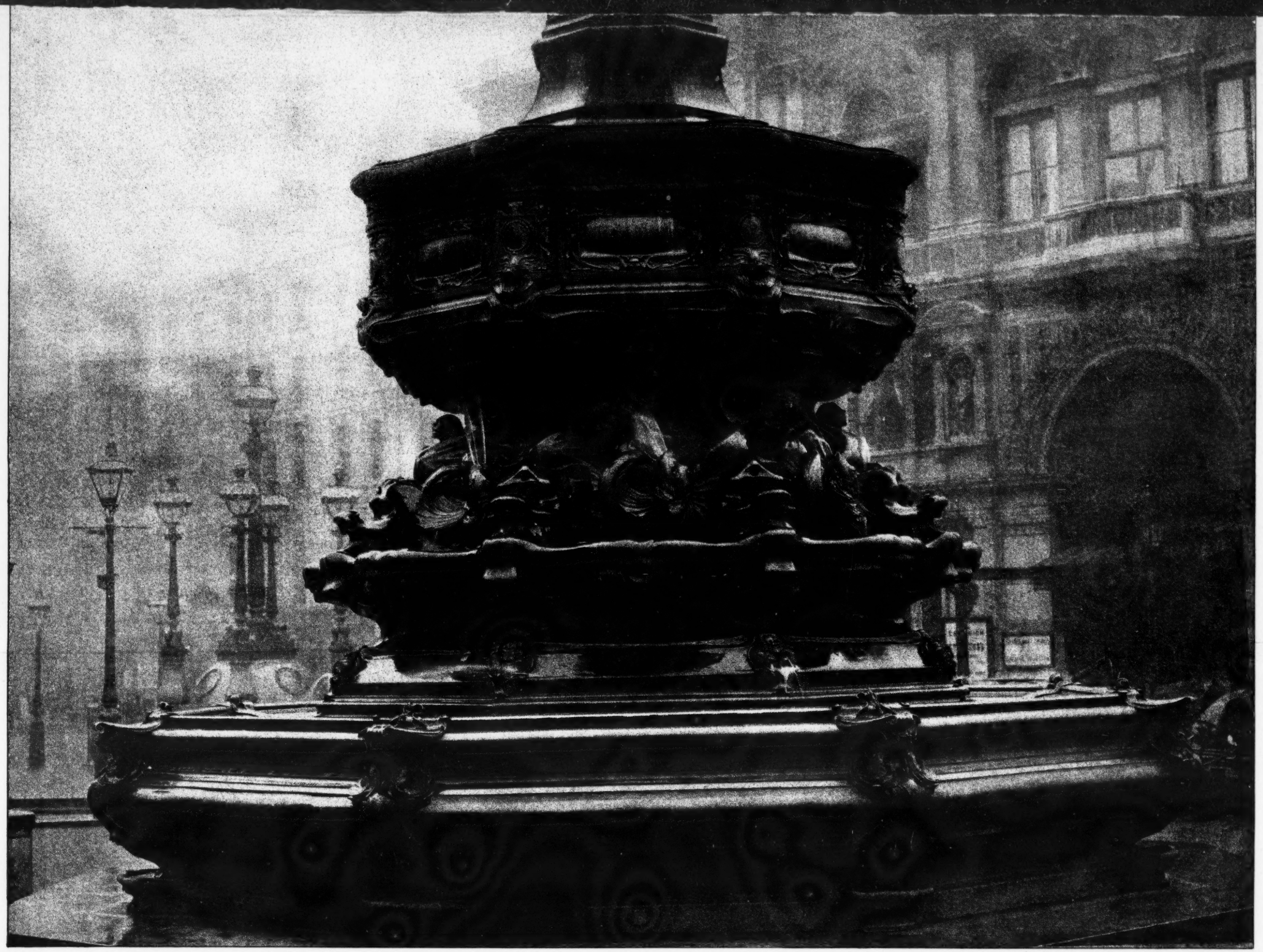

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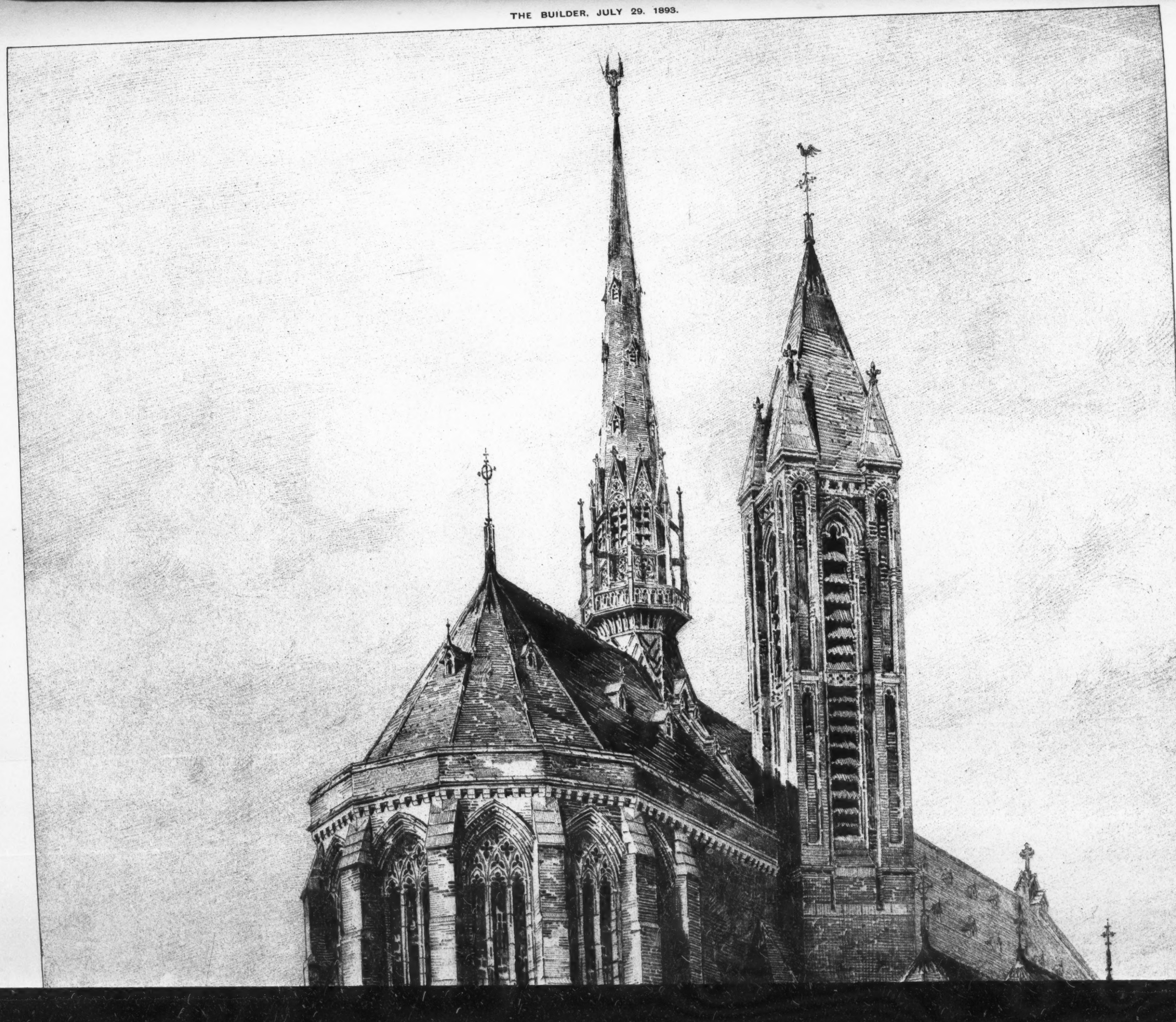

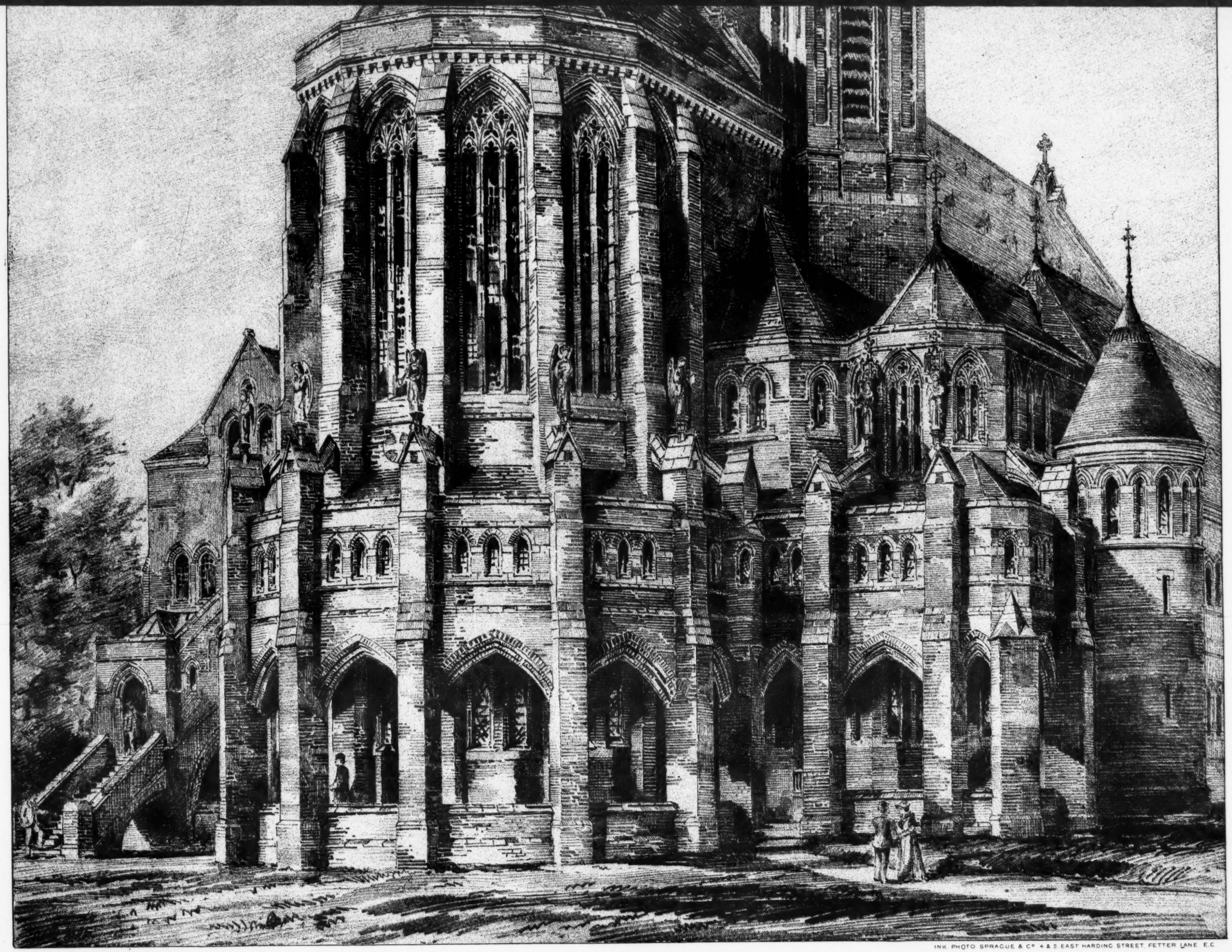

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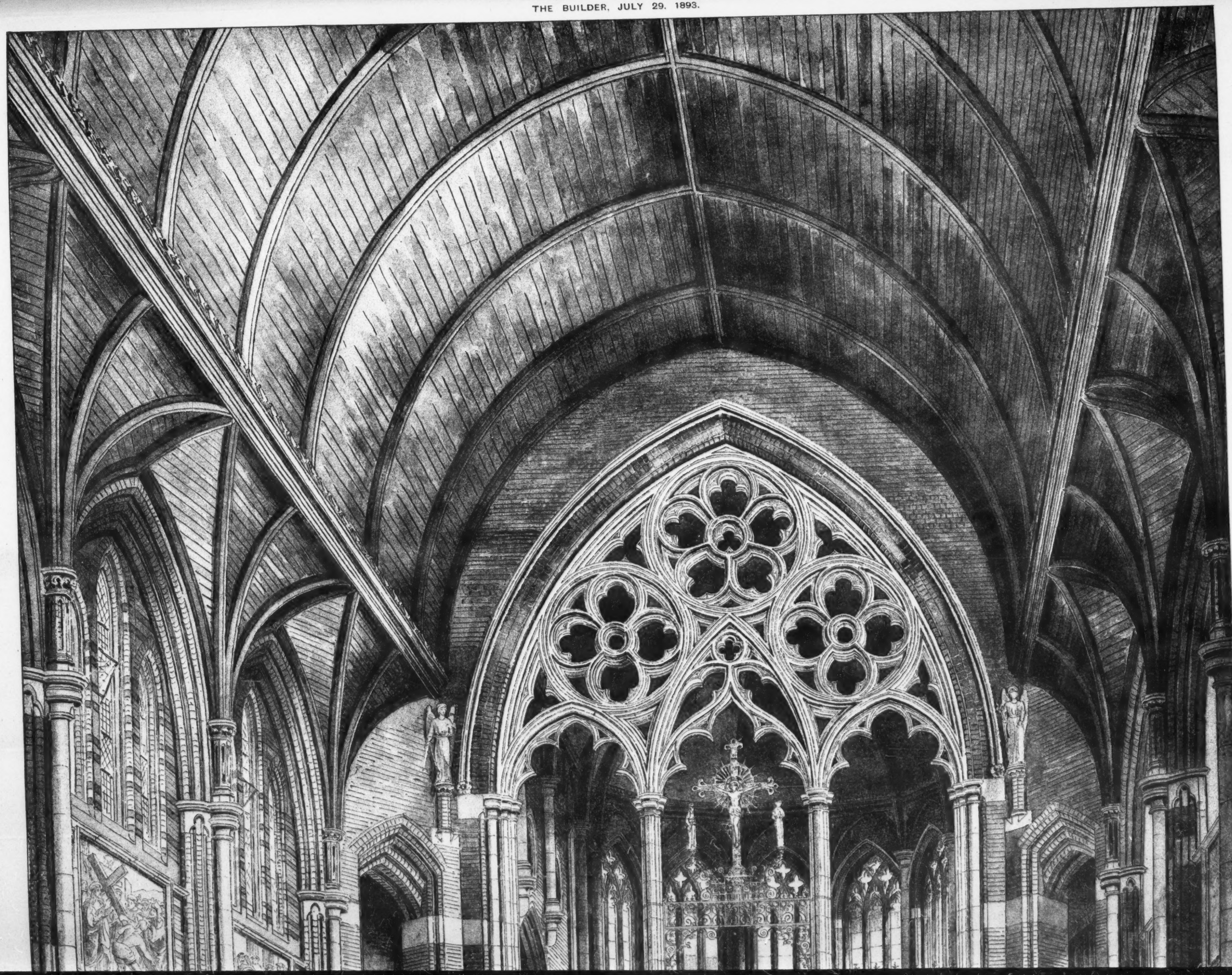

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